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JULY 1, 1890.

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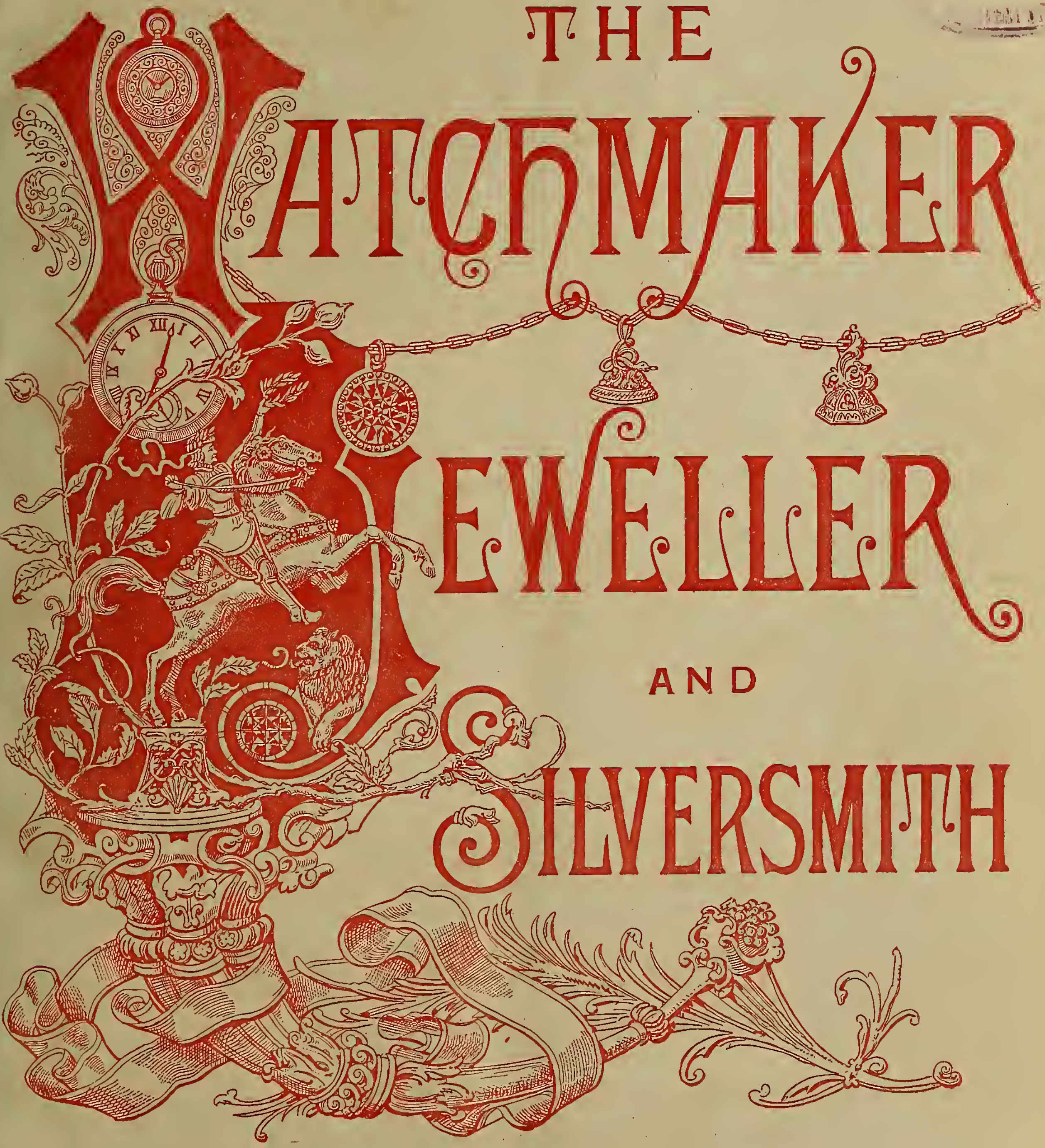
THE WATCHMAKER JEWELLER AND SILVERSMITH



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The Watchmaker, Jeweller & Silversmith.

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CONTENTS.

PAGE
Editorial ... 1
General Notes ... 2
The Diamond Market and Metals ... 3
New Goods for the Coming Season ... 3
Sheffield Notes. From OUR CORRESPONDENT ... 7
Royal Observatory Report ... 8
Shall the Manufacturers sell direct to the Shopkeepers ... 9
Formation of a Whitby Jet Syndicate ... 11
Diamonds in Amsterdam ... 11
A Jewellery Guard ... 13
Manufactured Precious Stones ... 13
Clockmaking Industry in Dieppe ... 14
Manufacture of Watch Glasses ... 14
Origin of the Diamond ... 15
Jules Jurgensen ... 15
Poetry in Bracelets ... 16
Jet ... 17
The Metallurgical Arts at the Paris Exhibition ... 18
Mechanical Ocular Defects ... 21
The Deeds of Arrangement Act, 1887 ... 23

The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. THE WATCHMAKER, JEWELLER AND SILVERSMITH will be found an exceptional medium for advertising. Special Notices, Situations, &c., per insertion, 1s. for two lines, prepaid.

Address all business communications to the Publishers,

MESSRS. TRUSLOVE & SHIRLEY,
The Watchmaker, Jeweller & Silversmith,
7, ST. PAUL'S CHURCHYARD, LONDON.
Birmingham Branch: 22, HYLTON STREET.

Agents for New South Wales and Queensland:—
MESSRS. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

WITH this number the *Watchmaker, Jeweller, and Silversmith* enters into its 16th volume, and, while wishing to avoid as much as possible the retrospective, it will not perhaps be altogether out of place if we point out here that the mere fact of a trade journal having existed for so many years under various changes of management and vicissitudes, is in itself a sufficient voucher for its being a necessity to the trades it represents. While the journal has been under the present direction, it has been the aim of the proprictors to extend its scope, so as to make it fully representative of the trades concerned. How far they have succeeded may be judged from the fact that during the same period it has been more than doubled in size, which is, in itself, a direct consequence of the increased support afforded it on all sides. While thanking our friends who have by their extended patronage rendered this result possible, we do not intend to make any promises for the future, further than to say that, given a continuance of the favours we have hitherto received at their hands—which we have no reason to doubt—no efforts on our part will be spared to both continue and increase the usefulness of the paper as the representative trade organ. Of course, the ups and downs of trade prosperity affect us almost as directly as they do our constituents. In trusting, therefore, that the next financial year with us will show as marked an improvement as those immediately preceding have done, we are only wishing a corresponding period of prosperity to what may be properly termed all the jewellery trades. Signs are not wanting that the coming season will be a busy one with the fancy trades—we, as unselfishly as the reasons aforesaid will allow of, cordially hope that the said signs may be trusted.

However, there is really no reason why the indications of buoyancy to be observed at present in many quarters should not be true ones. The jewellery business has recently passed through several severe crises, which it is not necessary to enumerate to our readers here, and may now (at least for some time to come) be expected to go on a firmer basis.

It is with this hopeful feeling, at all events, that we enter into a new volume.

GENERAL NOTES

Mr. Joseph Myers, of 3, Nicholas Croft, Shudehill, Manchester, desires us to state that he is in no way connected with Joseph Myers, 14, Duke Street, Aldgate, E.C.

Mr. Frederick B. Box informs us that among other transactions of the kind last month, he sold the business of Mr. J. B. Collier, 19, High Street, Southampton, to Mr. Elgood.

Messrs. Ganeval and Callard wish it to be known that they are now producing, by the latest processes, fire-hardened balance springs at prices that will compare favourably with those of the chemically-hardened springs of foreign manufacture. They solicit a trial of the same.

Messrs. Albert Roberts and Keene, lever pallet makers, Coventry, have dissolved partnership, and Mr. Roberts, in informing us of the fact, states that he has removed to 13, Lord Street, Chapel Fields, where he trusts a continuation of former patronage will be accorded him.

Reviving Tarnished Bronze.—Bronze, when tarnished, is revived by burning it yellow. To do this it is put into a mixture of 100 parts of nitric acid, 15 to 17 parts of muriatic acid and half to 1 part of chimney soot. The latter should be produced by wood smoke only. Sometimes a very small quantity of snuff is used for the same purpose. After this mixture is made it is poured into a china or glass vessel, and the object is quickly dipped into the fluid and immediately washed in a basin of water ready for use. A second washing in pure water is required. If the object is too large for immersing, the liquid is poured over it, a manipulation in which quick motion is necessary. The piece is then put in a bath of water acidulated with some pulverized tartaric acid. It is kept therein for some time, because the tartaric acid bath serves to preserve the beautiful bronze colour.

Working Goldsmiths and Jewellers' Association of Ireland.—The following was published in the *Irish Times*, of the 20th ult.:—To the Editor of the *Irish Times*. Sir,—I have been requested by the members of the above to forward you a copy of the following resolution, passed unanimously at their weekly meeting, held on Wednesday evening, 18th inst., and to ask you to kindly publish it in your influential journal.—Yours, etc., John Bermingham, Sec.——75, Aungier Street, Dublin, June 19. Resolved—"That as a large number of Dublin firms have kindly closed their establishments at an early hour on Saturday afternoon, and as some goldsmiths are among the number, we, the working goldsmiths and jewellers, respectfully ask that all our employers will follow the good example, and by so doing give their employés an opportunity of enjoying a half-holiday after the toils of the week."

Last month, Messrs. Mark Willis and Son, silversmiths, Rockingham Street, Sheffield, took the whole of their workmen and employés to Chatsworth. The company numbered about 70, and had a pleasant drive in wagonettes. A substantial meat tea was served up at the Royal Hotel, Baslow, and during the after proceedings, advantage was taken of the occasion to present to Mr. William Willis, who recently attained his majority, an elaborate dressing case, with silver-mounted fittings, which had been subscribed for by the workpeople. Mr. Willis suitably acknowledged the presentation, and the whole proceedings passed off in a very satisfactory manner. The marked and steady increase of business done by this enterprising firm with each succeeding year, is a just tribute to the quality of the goods they supply to their customers. We are pleased to see that, with increased prosperity, they are not forgetful of the actual producers, and have no doubt of having to chronicle further events of a similar pleasing character in connexion with this establishment.

A Bold Diamond Robbery.—A dispatch from Chicago, U.S.A., dated June 10, says that this afternoon a thick-set man, dressed in grey clothes, went into the jewellery store of Thomas and Casper, at the corner of Randolph and State Streets, and asked to look at some diamond studs. Three stones valued at 1,000 dols. were shown him and he walked to the door holding them up to the light. "These will do," said he to the salesman, and made a bolt for the street. As soon as the clerk could recover from his astonishment he cried "Stop thief!" and rushed out of the door after the stranger, who was disappearing around the corner into Randolph Street. A crowd of several hundred people took up the chase and kept the thief in sight until the corner of Washington and Dearborn Streets was reached, when the fellow disappeared, and has not since been seen. Several jewellery stores have suffered in this way, and the police say there is a regular organized gang at work. It is estimated that at least 10,000 dols. worth of diamonds and other jewellery have been stolen in this bold manner within three months, though the police have succeeded in keeping the matter quiet. It is thought that the depredators who are "working" the town are from New York, though their identity is unknown.

The medals presented to the champion footballers at Leeds the other day, and of which ceremony full accounts were given in the local and other sporting papers, were specially designed by Messrs. Fattorini and Sons, Bradford; they are about the size of a half-crown piece, and are of solid gold, very heavy, and exceptionally beautiful in conception, design, and execution. The obverse of the medal bears the arms of Yorkshire in juxtaposition with the arms of England, each shield being emblazoned in true heraldic tints in brilliant enamels. Two crossed flags support the shield, and a Rugby football fills the lower part of the medal. Surrounding the whole is the legend in plain gold letters, "England v. Yorkshire, at Bradford, Feb. 22nd, 1890." The reverse of the medal bears the inscription, in a garter round the edge, "Presented by the Yorkshire Rugby Football Union." The centre has the following score:—"Yorkshire, 1g, 3t; England, 1g, 1t, 1m;" and the names of each member of the team in plain characters complete the eventful record. The whole of the letters on both sides of the medal, as well as the flags, shields, the white rose of Yorkshire, and football, are all raised, being struck in most perfectly executed steel dies. The medal presented to Mr. Hickson is a special one, set with six diamonds.

Plate Licenses.—At the Hull Police Court, on the 26th ult., Frederick Steele, watchmaker, of 17, Russell Street, was summoned by the Inland Revenue for selling silver plate without a license. Mr. Worthington, Supervisor of Inland Revenue, appeared in support of the information. The evidence given by Mr. Herbert B. Ward, Inland Revenue Officer, showed that on the 1st of the previous month he was passing defendant's shop, when he saw several small articles of silver plate in the window. He entered the shop and purchased a bracelet for 15s., defendant stating in reply to his question that the article was silver. There were several other articles of silver plate exposed for sale, as also a watch. The defendant pleaded guilty, and said he had some justification. The bracelet and other articles mentioned belonged to his wife, for whom he was selling them. He did it principally to advertise his business. Mr. Worthington stated that it was in consequence of complaints that these proceedings had been taken. Defendant was a watchmaker, and therefore he must have known that a license to sell plate was required in his business. The stipendiary magistrate said he observed from the section under which these proceedings were taken that the penalty was £50, but he had power to mitigate it for a first offence. The Legislature considered it a serious matter, and he felt it his duty to impose a fine of £5 and costs.

A Receiver Severely Punished.—At Birmingham, on the 25th ult., Thomas Jennings (34), jeweller, was indicted for stealing, on May 15, 3½ ounces of silver scrap and 14½ dwts. of gold scrap, the goods of William Edward Hollis and another, his employers; and Henry Shaw (61), jeweller, was indicted for receiving the same, knowing it to have been stolen. Mr. Hugo Young appeared for the prosecution, and Mr. Parfitt defended Shaw.—Jennings pleaded guilty.—The police searched the house of Shaw with respect to betting transactions on May 15. As Detectives Moxon and Taylor were walking towards the house Shaw was seen to be talking to Jennings, his son-in-law. Jennings went away and the house was searched. The officers found in a drawer two packets of gold and silver scrap and two small melting pots. The former looked as though it had been recently cut and the latter as though they had been recently used. In reply to questions by the detectives Shaw said he had had the scrap in his possession for some years. As the result of inquiries it was discovered that the scrap had been stolen from Messrs. Hollis and Newman, Tenby Street North, where Jennings was employed. Jennings was arrested, and admitted being the thief, but Shaw persisted in the statement that he had had the scrap in his possession for some years. The defence was that Shaw was a jeweller, and that he had the scrap in his possession in the ordinary way of his trade. Prisoner was found guilty and sentenced to five years' penal servitude. Jennings was sent to gaol for six months.

The Spitzel Diamond Dispute.—The issue of a warrant for the arrest of Adolph Spitzel, described as a diamond merchant, has, according to the Melbourne *Age*, directed public attention anew to the circumstances of the recent dispute between the Postmaster-General and Mr. Louis Spitzel, a diamond merchant, of this city. Some time ago a packet of diamonds, said to be worth £1,000, and addressed to Louis Spitzel, was detained in the post office in compliance with the request of the Belgian Consul, who alleged that they were portion of an insolvent estate in Belgium. Subsequently it was announced that the diamonds would be sent back to Belgium, and Mr. L. Spitzel then obtained a temporary injunction against this step, urging in proof of his claim that the diamonds had been purchased for him by his brother, to whom he had remitted a draft for £1,000 on April 26. Adolph Spitzel himself arrived in Melbourne by the R.M.S. Orient, and inquiries were at once made about him, which, it is alleged, elicited the fact that Adolph Spitzel had been in business as a diamond merchant in Belgium, had obtained diamonds to the value of £8,000 by means of false pretences, and had become fraudulently insolvent. Application was accordingly made to the Governor for the issue of a provisional warrant, pending the arrival of warrants from Belgium. The matter has been placed in the hands of Detective Burvett, but so far no trace has been obtained of Spitzel's present whereabouts, and affidavits have been lodged to the effect that he has returned to Belgium.

Grant to the Birmingham Jewellers' Technical Schools.—A deputation from the Birmingham Jewellers' and Silversmiths' Association waited upon the Committee of the Guardians of Wrought Plate at the Assay Office on the 20th ult., for the purpose of presenting a memorial signed by over 200 of the leading firms of the trade, praying the Guardians to make a grant out of the funds of the Assay Office in aid of the equipment of the Technical School now being established in connection with the Branch School of Art in Vittoria Street. Mr. Henry Buckley, chairman of the Guardians, presided, in addition to whom there were present Messrs. H. A. Wiggin, C. W. B. Moore, W. Ashby Bolton, and the Assay Masters. The deputation consisted of Messrs. J. M. Banks, chairman of the Jewellers' Association, W. J. Ginder, treasurer, J. W. Tonks, hon. secretary, Charles Green, P. H. Levi, W. H. Lord, F. Nathan, W. H. Coley, A. G. McKewan, R. H. Jones, J. Wainwright, and Allen Edwards, secretary. Mr. C. Green introduced the deputation and presented the memorial, briefly explaining the objects of the school and its necessity as the complement to the art education now being given to the youth of the trade, and urged the pressing need of money to enable the association to effectively start it in its useful career. Mr. J. M. Banks and Mr. J. W. Tonks strongly supported the prayer of the memorial. Mr. Buckley, in reply, expressed the great pleasure it had afforded himself and his colleagues to meet the deputation, and said their object had his fullest sympathy in the present and best wishes for the future. He thereupon handed the chairman of the association a cheque for £500.

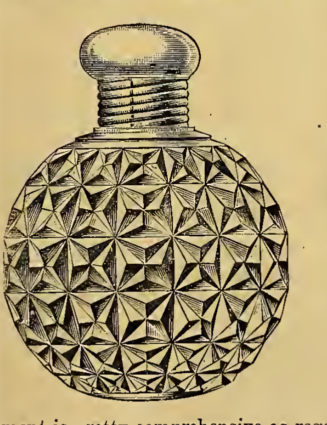
The Diamond Market and Metals.

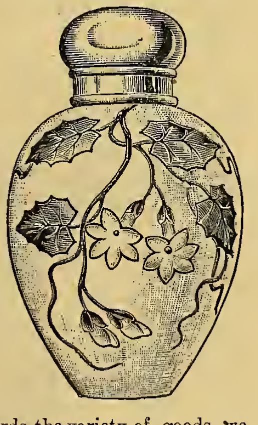
The Diamond Market.—The latest from *Amsterdam* states that the mean demand for small stuff continues, but the larger stones are difficult to place. The cutters are a little busier. The *London* and *Paris* markets showed little signs of increased activity, although, as the supplies were very good during the month, considerable business has been transacted in the former. As usual, the Americans were the principal buyers in the *Paris* market. Quotations from the fields are practically the same as they have been for the past few months.

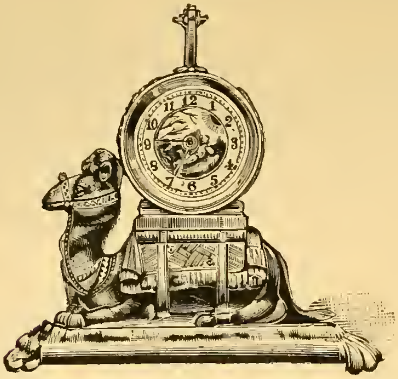
Metals.—*Silver:* Little or no business. Advices being awaited from the States. Bars, 47⅞d. In other metals the market has remained steady, the latest official quotations being:—*Copper:* Chili bars, G.O.B.'s and G.M.B.'s, cash, £59 2s. 6d. to £59 10s.; three months, £59 15s. to £60 2s. 6d. Australian nominal. *Tin:* Fine foreign, cash, Straits, £95 to £95 10s.; Australian, £95 2s. 6d. to £95 12s. 6d.; three months, Straits, £95 17s. 6d. to £96 7s. 6d. *Lead* is steady. Spanish soft, £13 5s. English ordinary brands, £13 7s. 6d. to £13 10s. *Spelter* is steady. Ordinary brands, £23 to £23 5s.; special ditto, £23 5s. to £23 10s. *Quicksilver*: The importer's price is still £10 10s., and that of second hands £10 4s. to £10 4s. 6d. *Antimony:* Star regulus, £72 to £75, according to brand and delivery.

New Goods for the Coming Season.

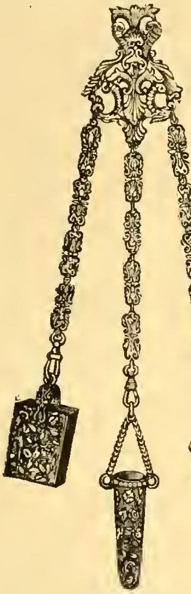
Messrs. H. J. Cooper and Co., 150, Oxford Street, are calling attention, in an advertisement in this issue, to some of the lines of specialities in the introduction of which they are the pioneers. Notwithstanding, however, that their announcement is pretty comprehensive as regards the variety of goods, we take the opportunity in the present notice (having their newly-published catalogue before us) of selecting a few other objects for illustration. The annexed cuts are from the catalogue referred to, and are sufficient to give an idea, or rather an indication, of the variety and nature of the goods stocked by the firm, although from such a voluminous work, which constitutes a regular buyers'

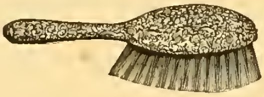


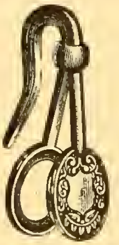


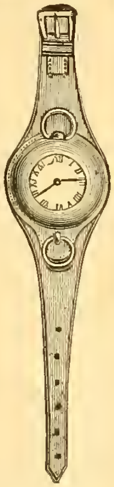


directory, comprising, as it does, some hundreds of pages, and a corresponding proportion of illustrations, it has been difficult to make a judicious selection. The best thing we can advise readers of this notice to do is that they write to the above address and apply for a copy of the list, which we understand the firm will be pleased to forward.

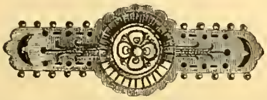


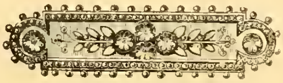


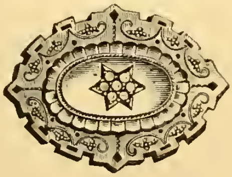




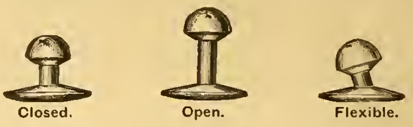
Another firm whose goods we lately inspected is that of A. Sydenham, 26, Frederick Street, Birmingham; to the annexed illustrations we call attention. Mr. Sydenham reports a continued and increasing demand for the special lines illustrated and advertised, for which he has just issued a new and revised price list, which will be forwarded on application. From the goods we inspected held in stock, and manufactured by this firm, we should say that buyers would secure a maximum of quality with bottom prices by opening accounts therewith.



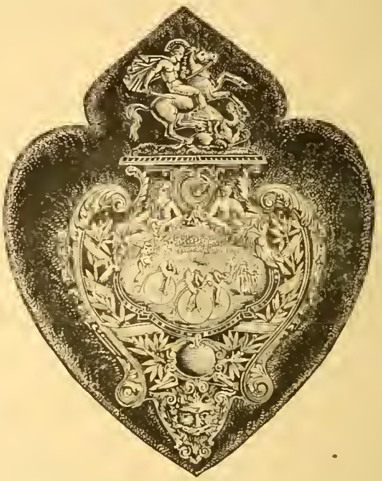


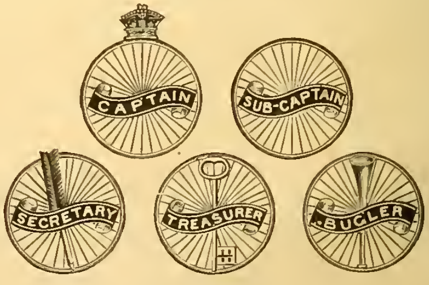


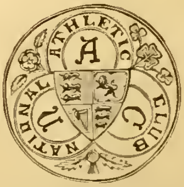
T. W. Jones, of Hylton Street, Birmingham, illustrates in his advertisement that well-known patent, the "Castle" link. No one who has handled these goods will be surprised to hear that the high estimation in which this good and simple invention has so long been held still continues, and that the demand for them is unabated. Mr. Jones has now placed upon the market an improved form of collar-stud, which he has registered under the same trade-mark. This is a revolving or flexible stud with a double back, in which it is impossible for the stem to pull through as it often does in the common makes of flexible studs. Another simple and strong form of collar-stud manufactured by this firm is shown in the annexed cuts. All these goods are quite up to the high standard for which Mr. Jones' name is a guarantee.



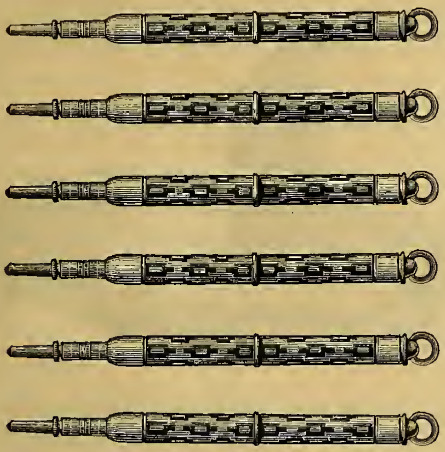
Messrs. Vaughton, of Gothic Works, Birmingham, are also a firm whose specialities should not escape the notice of buyers. Their particular manufactures consist of every class of medals, challenge shields, badges and insignia suitable for prizes for athletics, etc. Dealers should write for the firm's illustrated catalogue. The annexed cuts and the illustrations in the advertisement show a few of the goods referred to.

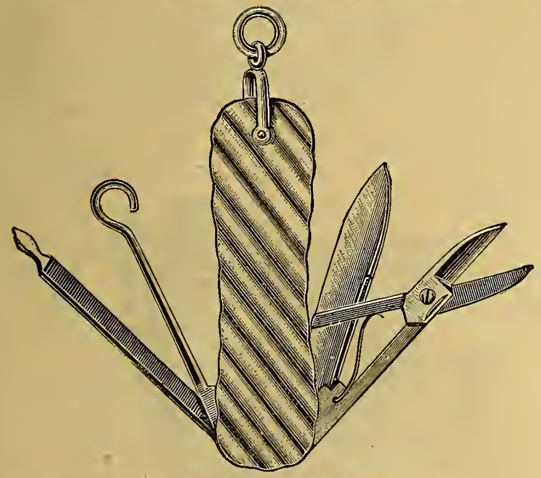


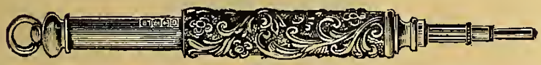


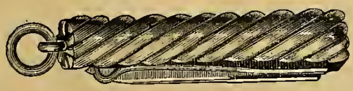


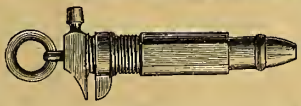
Another Hylton Street firm that should be encouraged by all who wish to do tribute to enterprise—Messrs. Lucas Brothers.





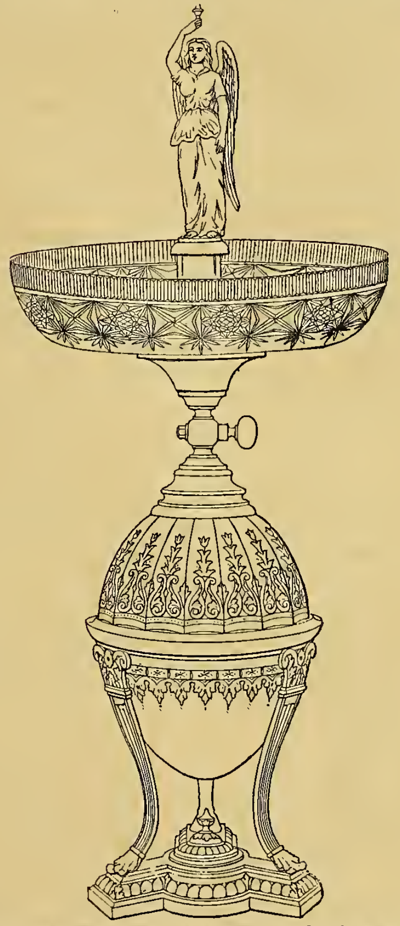






Their tastefully got-up advertisement is referred to and the goods shown therein, as well as those illustrated in the annexed cuts.

The Patent Automatic Fountain.—This is the title of a very effective centre-piece patented by Messrs. John Round and Son, Ltd., of Tudor Works, Sheffield. Some time ago, while going over these works, our attention was directed to an unfinished specimen of these fountains, the mechanism of which Mr. Ridge, the enterprising manager of the company, was good enough to explain. At that time the article had not been introduced into the market, the specimen before us being the only one in existence. Its capacity, however, for taking on a large amount of very effective ornamentation was quite apparent, and as Mr. Ridge remarked that they were preparing to send it out in a great variety of designs, a subsequent opportunity of visiting the works gave rise to great expectations. These expectations were fully justified by the event, for a more graceful display of silver and glass ware than that presented in the showroom of Tudor Works it is difficult to conceive of. The Classic and Renaissance ideas have both been drawn upon for suggestions in varying the outline and covering the surface of these unique fountains with ornament. The antique tripod and the Greek vase may both be recognised in the lower portions of some of the stands—not slavishly copied, but bearing the impress of the individuality of a competent designer. The vase-shaped base naturally adapts itself to the special necessities of the case, as it is here that the water has to be stored which plays such an important part in their economy. For although these articles may be used as ordinary centre-pieces or flower stands they are more than anything else fountains, and it is as such that Messrs. Round and Son ask the public specially to regard them. The lower portion of each stand therefore has to be of a certain capacity, and a great amount of skill and taste has been displayed by the designer in order to provide for this without appearing forced or unnatural. On the contrary, an easy gracefulness is characteristic of the whole of the designs which are displayed in the showroom of Tudor Works. When the fountain is working, which is effected by turning a small tap, the water is forced from the reservoir in the base to the upper portion of the stand by means of compressed air, which is stored in the same reservoir as the water. The manner of effecting this constitutes the patent which Messrs. Round and Son have the sole right of working. The idea is simplicity itself, and may be almost regarded as another instance of Columbus and the egg, the simplicity only becoming apparent when you are told how the thing is done. The reservoir is filled by means of a flexible tube attached to a main service tap, where there is of necessity



a great force of water. The other end of the flexible tube being attached to a small tap on the top of the reservoir, through which a narrow tube is continued nearly to the bottom, the water is forced in. There being no outlet for the air it is gradually compressed into the upper part of the reservoir, where it remains quiescent as long as the tap which works the fountain is turned "off." As soon, however, as it is turned on, the air begins to expand and forces the water a great height, whence it falls back into the elaborately-cut glass dish which crowns the centre-piece. The height of the jet may be regulated by simply turning the tap to a greater or less extent, and the fountain will play for four hours before it becomes necessary to re-fill the reservoir. For the benefit of customers living in country places where there are no service taps, Messrs. Round and Son supply a small force pump which gives the requisite amount of pressure in filling the reservoir. On the whole, Messrs. Round and Son's Patent Automatic Fountain gives the impression of a novelty which is sure to "take." What can be more soothing, for example, in these hot days especially, than to see on the table one of these chastely got-up centre-pieces, the richly-cut glass dishes filled with glorious masses of brilliant flowers and the jet of water rising into the air above them and falling back in the form of spray. The company evidently anticipate that the thing will "go," for everybody knows that patterns are not got up without a lavish expenditure of both time and money. The variety of patterns here is very great and of considerably more than average excellence, and would be sure to draw of themselves without the added attraction of the automatic fountain. With that thrown in, success ought to be assured. At all events, all who value high-class artistic silver work will heartily wish it.

Members of the trade who are in, or are going in, to the optical branch, should obtain, without delay, a little book (which appeared serially in these pages) published by Botwright and Grey, manufacturing opticians, of Spencer Street, Clerkenwell. It is (as formerly) entitled *Defective Sight and its Optical Correction*, and is by Mr. W. D. Mason, A.P.S. It is a complete summary of the theory of structure of the eye, and will prove a great acquisition to all who wish to thoroughly understand the optical business. Being written in plain and simple language (all the oculist terms being explained), and presented by Messrs. Botwright and Grey free to the trade, it is within reach of all.

Messrs. Stauffer, Son and Co., of 12, Charterhouse Street, E.C., have now in stock a charming selection of the artistic specialities for which this enterprising firm are so well known. Among some of these we had the pleasure of inspecting the other day may be more particularly mentioned some beautiful shell watch-stands, in which the polished surface of various coloured sea-shells forms an attractive background to the watch dial appearing in the middle, the whole making an exceedingly handsome ornament for the toilet table. Enamel watch cases, quite a new discovery in the art of enamel embellishment, in which a kind of filigree gold work is, as it were, mosaiced into the enamel, also require to be seen to be properly appreciated. We predict a big demand for these goods as soon as they become known. A full line (as factors say) of all the most recent designs in bijou watches is carried by the firm. These comprise insect, flower and other kinds of watches, having the *gallerie* winding mechanism, in which the artist's genius is allowed to have full bent in the utilisation of enamel and precious stones for ornamentation. Without illustrations (or even with them) a written description of these goods would be totally inadequate to convey an idea of their merits. They must be seen to be admired.

In the fancy trades novelties are ever in demand. Buyers are always on the look out for "something new," and novelties with any merit, either ornamental or useful, are sure to meet with success if well produced and properly put on the market at popular prices.

Mr. F. W. Powell, of 5, Hatton Garden, wholesale jeweller and silversmith, inventor and patentee, is an inventive genius who has turned his attention to useful fancy articles suitable for gentlemen; and being a practical manufacturing jeweller, he possesses great facilities for the production of his ideas, and, having acquired a reputation for novelties among the trade, his goods are always in request.

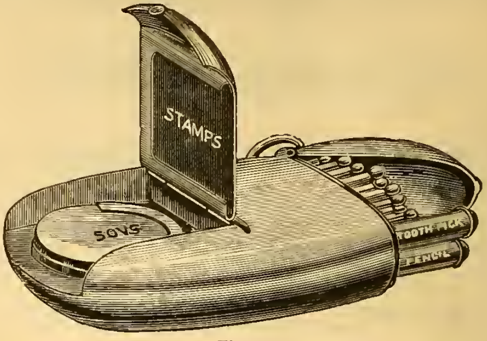


Fig. 1.

One of his first ventures was the "Combination" matchbox (Fig. 1). This, as will be seen from the above block, which is the exact size, contains a pencil and toothpick, and spaces for matches, stamps and sovereigns. So ingeniously is this speciality fitted together that, although it will take five sovereigns, about twenty stamps, and fifty matches, it is not much larger than an ordinary vesta box, and can be carried quite comfortably in the waistcoat pocket. It is beautifully made, is finished in electro and silver. The best proof of the success of this article is the fact that 13,492 have been sold up to December 31, 1889, and that it now has a steady sale as a staple commodity.

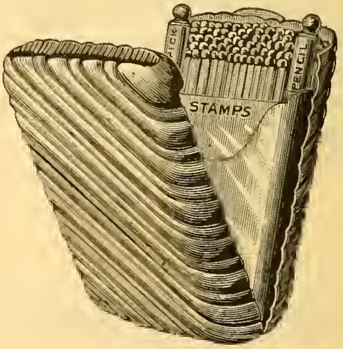


Fig. 2.

The "Union" match box (Fig. 2) was produced to provide a box for those who object to carry their gold with their matches. It is made on a different and new principle, and in a new combination of metals, which is as white as silver throughout, and, being much harder, is guaranteed to wear even better than silver itself. This box is made either plain, engraved, or fluted.

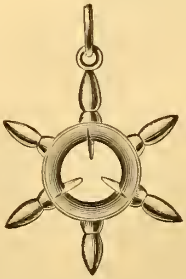


Fig 3.

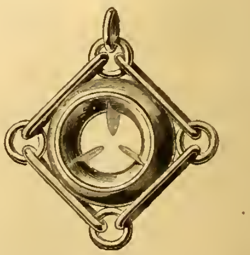


Fig. 4.

The next patent, produced about nine months ago, was the "Simplex" cigar slitter; and so rapidly did this "catch on," that for the first three or four months it was quite impossible to keep pace with the demand, notwithstanding the fact that one of the largest firms in Birmingham, employing several hundred hands, had the contract to manufacture it. Figures 3 and 4 show the most favourite designs out of scores of patterns.

It will be seen from the sketches that there is no mechanical action in this cutter, and it consequently cannot get out of order. It has three semi-circular steel knives, riveted and soldered inside a convex or bevelled tube, into which the tip of the cigar is pressed. The three knives make three incisions in the sides of the cigar, creating thereby a perfect draught; and as the actual tip is neither removed nor destroyed, the outer leaf does not unroll and become loose in the mouth, and the tip remains intact until finished. No fewer than 23,682 have been sold in six months in Great Britain alone.

This cutter became such a favourite that it has been combined with a match box, as shown in Fig. 5, and christened the "Duplex" match box.

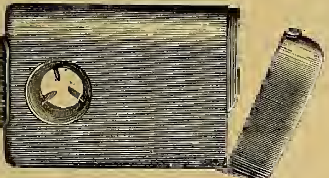


Fig. 5.

This is made in two qualities of metal, and in silver, plain, engraved, and fluted.

One of the last successes is the "H.P." cigarette paper case (Fig. 6), a neat and compact case for holding cigarette-papers. This is made with a groove, into which the book of papers is passed, and a sliding bar is pressed into the groove behind, thus holding the papers securely, which are torn off one by one as required for use. This case will take any of the favourite makes of paper, either "Job," "Cosmopolite," or "A.G." It is made in metal (electro) and silver, plain and engraved.

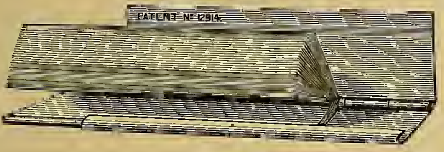
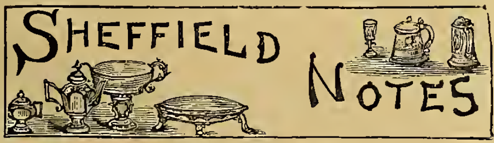


Fig. 6.



SHEFFIELD NOTES

From Our Correspondent.

It seems that no more Sheffield witnesses are to be allowed to give evidence before the Merchandise Marks Committee, lest the measure should have the appearance of being too exclusively a Sheffield measure. This is a pity, as it almost looks like falsely naming the very Act of Parliament that has to do with false marking. The idea of dealing with fraudulent trade marks by an Act of Parliament originated in Sheffield, and its main support has hitherto come from Sheffield. No other town seems in a great hurry to come forward. This may mean little or it may mean much, but at any rate we feel that we have some sort of reputation for fair dealing which it is worth while making an effort to preserve.

Not much has been heard recently about the canal scheme. It is now, however, once more coming to the front. Before the scheme can be carried out it will be necessary to come to terms with the Manchester, Sheffield, and Lincolnshire Railway Co., who are the owners of such water way to the Humber as already exists. Of course, the Act obtained last session made provision for this, but a certain length of time was allowed the Railway Co. in which it might voluntarily dispose of its property to the Navigation Co. This period has now expired, and the compulsory powers obtained under the Act will now be put in force. The first step—that of serving a notice on the Railway Co.—has just been taken by the solicitors to the Navigation Co , and it is their intention to push the matter forward with all speed. Should the two companies still fail to agree, the purchase-money and the terms and conditions of the sale will have to be settled by the railway and canal commissioners as arbitrators, who are also empowered to determine what lands and property are to be deemed a part of the navigations, or be included in the transfer.

A meeting, representative of the colliery owners of South Yorkshire, has been held here to consider the question of contracts. The altered conditions of the coal trade has rendered this step necessary. It is usual for the railway companies to enter into contracts for twelve months, a practice which has told heavily against the coal interest during the past year. For example, the North Eastern Railway up to December 31 last were getting their steam coal for 8s. 6d. per ton, which means that during a great part of last year the colliery proprietors were losing 2s. 6d. per ton on coal supplied under this contract. To remedy this state of affairs the meeting decided that an understanding should be come to among the members of the association as to the terms upon which contracts should be entered into for the current year. It was ultimately agreed that 10s. 6d. per ton would cover all risks for the present year, and the meeting pledged themselves to enter into no contracts for any lower figure. The Midland Railway Co. has since agreed to these terms, and the Manchester, Sheffield, and Lincolnshire Co. has also signified its assent, although for a period of six months only.

Mr. H. L. Brown's mode of celebrating his silver wedding commends itself to one's sense of the fitness of things. The enterprising jeweller of Market Place, instead of inviting his friends and neighbours up to Albany Road to rejoice with him, has treated the children of the Jewish schools to a trip to Baslow. This is better than a ball at the Cutlers' Hall, which our Jewish fellow-townsmen so much affect. Judging from appearances, I should say that Mr. Brown and his amiable consort enjoyed their trip to the pretty Derbyshire village as much as the jovial youngsters themselves. When they celebrate their golden wedding, which I hope they will some day, these same youngsters will be men and women, and may be in a position to make some sort of recompense; but in the meantime Mr. Brown has done a kindly act which cannot fail to be its own reward.

Shrewd observers of human nature warn us to beware of the man who has no hobby. Mr. Fred. Sybray, of the firm of Sybray and Hall, silversmiths, has a soul above making spoons and teapots. His is no mere hobby—it is a sacred Mission—with a capital M. Away from business, Mr. Sybray's peculiar form of relaxation is the carrying on of a crusade against overhead telephone wires. Don Quixote tilting at windmills is a mere circumstance to Mr. Sybray running amuck among telephone "attachments." The idea has so taken possession of him that he now objects to their being run underground as well. Nay, he more than objects—he is ready to set the machinery of the law in motion against all and sundry who dare to violate his views of propriety in this matter. Now this is very courageous, and is as much above the ordinary hobby as hunting lions and tigers is superior to common sport. It is the element of danger which dignifies it—because, you see, in a lawsuit one of the parties must come to grief. Even Mr. Sybray himself is not invariably successful in tussles of this kind, as witness his recent action against the Goldsmiths' Company in the Assay case. Nevertheless, to go back to our initial proposition, nobody need avoid Mr. Sybray on the score of his disinclination to ride a hobby when he leaves his works behind and goes to ruralise in suburban Dore.

Messrs. Hutton and Sons are likely to have more trouble with their workmen. Some time ago it was the spoon and fork filers—now it is the workmen in the hollow-ware department who threaten to strike. The firm have promulgated an order that day-work should be abolished throughout the works and that all their hands should work by the piece. This of itself is no grievance, as piece-work is the rule rather than the exception throughout the Sheffield trades. The men allege, however, that the prices fixed are so unremunerative as to leave them no alternative but to cease work. This may or may not be the case—it is always a delicate matter to criticise the relations between employers and employed. I cannot help thinking, however, that great want of tact has been displayed by the management of Hutton and Sons, as no other firm in the electro-plate trade have or are likely to have any dispute with their work-people.

Since writing the above, I hear that the Stampers' Union—a very powerful one, by the way—is going to support the men if the dispute should ultimately culminate in a strike or a lock-out. It is to be hoped, however, that wiser councils will eventually prevail, and anything like a prolonged struggle be avoided. From Messrs. Hutton and Sons' point of view I should say that this is scarcely a time for gratuitously provoking a conflict with their work-people. Whatever may be the case in the works at West Street, trade is decidedly good in all the other electro-plate manufactories of the town. The pressure of orders is certainly greater in some firms than in others, but the spirit of hopefulness is universal. Anything, therefore, which tends to hinder both masters and men from reaping the fall benefit of the prosperity which prevails is to be deprecated.

The new Town Hall scheme has now advanced another stage towards ultimate accomplishment. The assessor appointed by the corporation, Mr. Alfred Waterhouse, has given his award in favour of the design sent in by Mr. Edward M. Mountford, A.R.I.B.A., of Chandos Chambers, 22, Buckingham Street, Strand. This choice has been ratified by the Town Hall Committee, and only awaits the formal assent of the full body of the council. We are thus within measurable distance of having the reproach of years wiped out and becoming the happy possessors of a stately building which will be a credit to the town.

The shopkeepers' half-holiday movement just inaugurated has thus far proved an unqualified success. For the last few Thursdays the town has, after four o'clock, worn the aspect of a Bank Holiday. Not only in the centre of the town, but stretching away into miles of suburbs, closed shops have been the rule and open ones the exceptions. Commercial travellers will, therefore, do well to make a note of this and avoid Sheffield on a Thursday, unless they are good for a trip to one of the many charming resorts to which Sheffielders congregate on the slightest provocation. In that case let them come by all means, and they will not regret it.

The progress of the Tariff Bill, now all but passed by the Legislature of the United States, is watched here with keen anxiety. In spite of the present all but prohibitive tariff, there are dozens of Sheffield firms whose trade is almost exclusively American. How these will fare should the Bill ultimately pass into law is the question of the hour. The very best qualities of Sheffield cutlery will probably always sell in the States, whatever the price may be; but to the more ordinary sorts the United States will probably be a closed market. This is a most serious matter for the town at large, and the feeling against the Yankees is most intense. Retaliation is not only talked about but strenuously advocated by a large section of the community. Never were the principles of Sheffield Free Traders put to so severe a test as they are at present.

Royal Observatory Report from 1889, May 11, to 1890, May 10.

Chronometers, Time Signals, and Longitude Operations.

THE annual report of the Astronomer Royal is just issued, and from it, it appears that the number of chronometers and deck watches now being tested at the Observatory is 165 (121 box chronometers, 19 pocket chronometers, and 25 deck watches). The annual competitive trial of chronometers commences on July 5, and the trial of deck watches on October 25.

In the year ending 1890, May 10, the average daily number of chronometers and deck watches being regularly rated was 209, the total number received was 663, the total number issued was 703, and the number sent for repair was 368.

The annual trial of chronometers (which lasts for 29 weeks) has been rather more searching than that of last year, as the range of temperature to which the instruments have been subjected has been nearly continuous from 42° to 99°. The mean temperature of the room ranged from 50° to 67°, and in the oven the chronometers were tested at mean temperatures of 75°, 85°, and 90° to 96½°. Notwithstanding this increase of severity, the chronometers were found to compare well with those tested in former years, and the performance of the first on the list (as inferred from the trial number) has never been surpassed, and only once equalled (in 1882). The average "trial number" of the first six chronometers was 18·9, which compares favourably with the corresponding value in former years.

For the annual trial of deck watches, 1889, October 26, to 1890, February 15, 25 watches were entered, and of these 19 were purchased for the Navy, the first 13 being classed "A," or equal in performance (on the 16 weeks' trial) to an average box chronometer. The trial was four weeks longer than that of other years, and yet the performance is, on the average, better than in any previous trial, the performance of the first four watches being superior to that of the best watch hitherto tested.

Two chronometers have been tested for the Crown Agents for the Colonies; 7 for the Indian Government; and 2 for Dr. Gill.

Experiments have been made in the past year on the uniformity of rate in deck watches and chronometers with reference to the time elapsed since winding. In 1889, October, two deck watches, one keyless, with going barrel, and the other an ordinary key-winder, with fusee, were carefully compared several times during the day, but no systematic variation of rate could be detected. In 1890, February, 7 watches (all keyless) were compared at 0^h, 2^h, 4^h, 6^h, etc., after winding; but again no change of rate could be detected.

A somewhat different experiment was made with the box chronometers in the annual trial. These were wound for the last fortnight of the trial on alternate days, and the rates for the days on which they were wound were compared with those of the intermediate days. No systematic effect on the rate could be detected, except perhaps in the case of one chronometer near the bottom of the list in order of merit.

On 1890, January 25, the Greenwich time-ball was not raised on account of the violence of the wind; and on 1890, April 1, the springs of the Mean Solar clock failed to act, so that the ball did not drop, nor was any signal transmitted to the Post Office. There was also a failure in the 1 p.m. signal to the Post Office on November 27, but the fault was not at the Observatory. Owing to a mistake in the numeration of seconds on the chronograph, coupled with a sudden change of rate of the sidereal standard clock, the 1 p.m. signal was erroneous on September 2, 3, and 4. On all other days it was sent out correctly.

The automatic drop of the Deal time-ball failed on 21 days owing to interruption of the telegraph connections, and on one day high wind prevented the raising of the ball. There have been frequent failures in the return signal, the arrangements for which are not in a satisfactory state. It appears that some time ago the Post Office authorities arranged for the substitution of a hand signal for the automatic return signal, which was found not to give a sufficiently long contact. The value of the return signal has thus been greatly diminished, and I propose to revert to the automatic signal, modified as regard the duration of contact, so as to suit the arrangements of the Post Office Telegraphs. It would be desirable that this signal should be sent at as short an interval as practicable after the ball-drop so as to serve as a check on the accuracy of the time-signal.

The contact springs of the Devonport time-ball clock having been readjusted after the failure mentioned in the last report, signals have been received regularly since 1889, May 23, except on 26 days, of which seven were Sundays. The apparent error of the clock-signal (after daily correction of the clock by the help of a time-signal from Greenwich) was under $0^{s}\cdot2$ on 63 per cent. of the 337 days of observation, under $0^{s}\cdot5$ on 94 per cent., between $0^{s}\cdot5$ and $1^{s}\cdot0$ on 5 per cent.; and exceeded 1^{s} on 3 days, all of them Sundays. Six of the 17 days on which the error exceeded $0^{s}\cdot5$ were also Sundays.

The automatic signals from the Westminster clock have not been received very regularly, there having been failures on 44 days in the year ending 1890, May 10. The error of the clock was insensible on 39 per cent. of the days of observation; it amounted to 1^{s} on 42 per cent., to 2^{s} on 18 per cent., and to 3^{s} on 1 per cent.

Observations for the determination of the longitude, Dunkerque-Greenwich, were successfully carried out in June and July, a spare wire and the services of a clerk having been courteously placed at our disposal by the Post Office authorities. Two observers, Commandant Defforges and Mr. Turner, made observations in four groups of two nights each, or the equivalent in half-nights, interchanging between the first and second group and again between the third and fourth. The reductions are complete as far as the first approximation to the result, but the final reduction of this longitude, and also of the Paris-Greenwich longitude, for which observations were made in 1888, has been delayed by the discussion of a curious discrepancy between the results obtained for clock error at one of the stations in the latter by the two instruments mounted side by side, and used by the French observer and the English observer respectively. The difference amounts to $0^{s}\cdot3$, but it has not yet been found possible to say with certainty which of the instruments has given an erroneous result. The two instruments used by the Greenwich observers were set up side by side in the Front Court on 1890, April 17, and a number of observations made with them simultaneously by Messrs. Turner and Lewis, showed a perfectly satisfactory accordance. Commandant Defforges proposes to come to Greenwich very shortly to discuss the results in reference to this discrepancy in concert with the Greenwich observers.

By request of the French observers, the difference of latitude between Greenwich and Paris was determined in July by simultaneous observations, with similar instruments. The result inferred for Greenwich is within $0''\cdot1$ of the adopted value.

During last summer, Lieutenants A. M. Field and H. E. Purey Cust, R.N., made a series of observations on the relative advantages of the portable transit and sextant, for determining local time, their report to the Admiralty being in favour of the former.

It was mentioned in the last report that the Indian invariable pendulums had been mounted in the record room under General Walker's supervision. The three pendulums have each been swung 8 times, at pressures of both 2 inches and 27 inches, and the observations completely reduced, giving the following results for number of vibrations in a mean solar day, reduced to vacuum, a temperature of 62°, an infinitely small arc, and sea-level; the corresponding values obtained at Kew being appended for comparison:—

Pendulum.	Greenwich.	Kew.
4	86,165·54	86,166·50
6	86,065·70	86,066·61
11	86,117·04	86,117·03

Shall the Manufacturers sell direct to the Shopkeepers?

THE utility of and the necessity for the middleman is a question of rapidly-growing interest to our trade. His position has long been questioned by a small but increasing minority of the makers proper, while in many other cases the factors have attempted to solve the matter by themselves manufacturing a certain portion of their stock. So far no very definite results have been attained on either side; but what with mutual encroachments the makers and factors, purely and simply such as known of old, will soon cease to exist among us.

At first sight it does appear as though the present complex arrangements for making and distributing were an unnecessary extravagance, as though the interests of business could be served more economically by some more direct system of communication between the producer and the final purchaser. Certainly the multiplication of profits as now existing adds greatly to the extrinsic value of the goods, and to that extent actually limits the demand for them. Whether under these much-advertised "buy direct from the makers" conditions any appreciable increase of trade would accrue; whether the trade, considered on the whole as a means of livelihood, would gain or lose by the change; and, finally, whether the public would reap any advantage from the deleted profits by being able to buy their jewellery more cheaply. These are all moot points, to the consideration of which it is our immediate intention to proceed.

To grasp this subject in all its bearings we need to formulate some satisfactory reason for our existence; to determine our function as a portion of the national life contributing to the national prosperity. Is it ours simply to supply the public with jewellery at the lowest possible rate? Is this the one end and aim for which we, as a mass of workers in gold and silver, exist in the body politic? Surely there is some better object, some greater value for us, than this. The actual worth of a business in the economy of the state is directly as the number of individuals to which it affords support. That trade is said to be in a healthy and flourishing state whose workpeople are all employed at a fair wage, and whose master-men are all gaining a fair profit. That trade is rightly described as being in a bad way when its workers are semi-idle and badly paid, when its masters are simply living on their capital. Hence, then, we draw our first conclusion, viz., that the existence in our trade of the factors and their large administrative staffs, although non-producers, is not necessarily an evil. They represent a large section of the population who gain their living in, and are supported by the jewellery trade, and they are essentially connected with its growth and prosperity. Suppose for a moment that the whole body of factors were done away with, leaving the manufacturers in direct communication with the shopkeepers, what would become of the numbers of both employers and employed who would thus be thrown out of business. There are two alternatives; either they must become producers, that is, manufacturers and workmen, provided there is a sufficiently increased demand to keep them employed, or they must give their energies to and draw their support from other trades. The former state would be right enough if possible, that is if the necessary demand existed, but, as we shall show later on, the possibility of such an increase is very remote indeed. The latter condition would seriously diminish the value of the business as a national function by reducing its life-sustaining powers. In the former case there is no actual advantage to be gained; in the latter case there is much to be lost.

Now as to that suppositional increase of business that is to follow immediately upon the extinction of the factors. To what extent is it imaginary; to what extent is it probable. It is usual to class jewellery indiscriminately as an article of luxury, and to jump to the conclusion that its demand is regulated by the ordinary laws which govern the call for luxuries. But it is more than this; it is an article of personal adornment, *and as such it is essentially an article of necessity.* To a certain extent the public must and will have jewellery, and there is a constant demand for it underlying all the fluctuations of bad trade and high prices. The gross value of jewellery sold in a given time depends not upon the relative high or low prices at which it is offered, but upon the amount of cash that the purchasing public have available for the purpose. It follows, therefore, that it would require far more than a mere ten or fifteen per cent. reduction (even supposing the public got the direct benefit of the whole of the saving effected) to produce any great increase in the demand for goods. Thus there would not be sufficient scope for the factors and their staffs to all turn producers, and they would be forced to look elsewhere for their living. And the withdrawal from our trade of those who now exist upon it would not be for its good. In throwing over, as it were, a portion of its responsibility and a share of its dependants its value to the state would be greatly diminished.

Further, we do not think that the ultimate purchasers would reap much, if any, of the apparent saving. Part of this would be absorbed by the extra expenses incurred by the manufacturers in the distribution of their goods and the collection of their accounts. Part, doubtless, would go into their pockets as additional profit. The balance devoted to the actual reduction of retail prices would be so small as to have absolutely no effect in producing an increased demand.

Thus, to summarise our position so far, we find that the factors and their assistants are not an encumbrance to and a drag on the full working of our trade, but that they are an orderly part of the machinery necessary for its complete carrying out; that the increase of business resulting from their removal would be altogether too trivial to allow of the trade giving scope for them all as producers, consequently that the position and importance of the trade, among trades, would be seriously lowered. We are, therefore, forced to the conclusion, from theoretical grounds, that any universal attempt on the part of the manufacturers to confine their dealings simply to the shopkeepers, would tend ultimately to the disadvantage of themselves and of the trade generally. This is not the conclusion we expected to arrive at when we first began to give this matter special consideration, but it will perhaps be of greater value as it has forced itself upon us almost against our intentions.

There is, however, a practical aspect to this question in addition to the foregoing idealistic one. Let us see if from an internal working view the conclusions are the same as from the standpoint of political economy. Perhaps the most remarkable feature of the manufacturing portion of the jewellery trade is the minute and exclusive sub-division system under which it is carried on. A ring or a breast pin, a brooch or a locket, a watch-chain or a set of sleeve links, these are all produced by jewellers, but the maker of any one of them would not have the slightest idea of making up any of the others. Further even than this, the maker of coloured gold brooches would not touch bright goods; and the gem ring trade is entirely distinct from keepers or wedding rings. We do not cite these instances to cavil at the system. It is undoubtedly the result of long experience, and we are quite willing to accept it as the best and most convenient system possible. But we do cite them as illustrating the usefulness of, and the necessity for, the factors. Let us look for a moment through a manufacturer's stock and then through the stock of a factor, and note the chief differences observable. Take, for instance, a maker of ladies' half-suites; we look through roll after roll, case after case of brooches and earrings, and still with all their bewildering variety we notice a definite style, a sort of family likeness, running through, which marks them always as being of So-and-so's make. The same thing is noticeable with any individual maker of rings or bracelets, pins or links. There is plenty of variety within certain limits, but these lines of demarcation are seldom, if ever, overstepped. With the factor, however, this exclusiveness does not obtain. In glancing over his stock we see an epitome of the whole manufacturing trade. His ring stock may not be so large as that of a given maker (we are referring, of course, to first-class houses in either case), but it will be far more complete in its variety. His brooches or bracelets, his pins or links may not compare in bulk with the stocks of the makers of these several articles, but he will be able to show a representative assortment as to style, design, price and quality such as no individual manufacturer could possibly produce. And this is just what is required for the supply of the retail trade. A shopkeeper does not usually buy large quantities of any given article, much less of any special style or quality. A well-selected variety is what he requires, and to such a stock will he give his best attention. Here again we see that the factor exists not as an encumbrance, not as a superfluous growth sapping the vitality of the trade, but as a necessary, a useful and a healthy portion of the system best suited to the present conditions of our business.

And, considering the matter from the manufacturer's own standpoint, we are likely to arrive at the same conclusions. The actual expenses of travelling the country are very great—a ten per cent. on the value of the stock carried or on the amount of business done being a moderate estimate—and a large turn-over must of necessity be done to pay at all. A factor's traveller with his microcosmic stock has at least a chance in every town he may visit, at every shop he may call on. He has a thousand-and-one articles wherewith to tempt the reluctant buyer, and if one class of goods is not wanted, another may be. So he can almost guarantee selling something to cover his expenses even at his poorest places. But what manufacturer's stock could go out with this advantage? If brooches, or rings, or pins are not wanted, then instead of opening another pad or turning to a fresh bag, he has simply to pass on till he find a spot where pins, or rings, or brooches are required. Under expenses nearly, if not quite, as great his chances of selling are vastly limited. He might often work through a town without selling enough to pay his railway fare from his last stop, while he would be forced to miss entirely a large number of small places where the factor might pick up a sufficiently remunerative return. Selling direct to the shopkeeper is very plausible as a theory, it looks temptingly utopian to the maker anxious to increase at once his business and his profits, but looked at in the light of practical possibility we do not see how it could possibly fulfil his expectations. As a simple matter of fact it would not pay.

Further, what about the much talked-of shopkeeper himself and his position in reference to this matter? Surely he is not an inert and submissive party to the bargain. It may suit his fancy or his convenience to place one or two special lines directly into the hands of the manufacturers, but it does not follow necessarily that he would willingly have all his dealings with them. The mere waste of time in going through twenty or thirty stocks for replenishing his show cases, instead of the two or three as at present, would be a serious item to him, while the extra booking and the additional accounts would, in many instances, tax the resources of his limited staff. Especially would this be the case with his jobbing and appro trade. Whereas under the existing system he would draw all his requirements from one or two sources; he would need under the conditions we are discussing some twenty or thirty additional correspondents. The complications thus effected would, we feel confident, work more harm than good to the trade at large, and any such innovation to any general extent would prove a failure.

Thus we see all along the line the conclusion is the same. The focussing function of the middleman is essential to the proper carrying on of a business embracing so diverse and widespread a series of articles. It is his to collect and to distribute. His work is not waste; his pay is not loss. He is an integral part of the administrative machinery without which the work could not be done so well, if at all.

Finally, as to the actual facts of the case as at present existing. There are some factors who are also manufacturers; there are some manufacturers who sell direct to the shops; there are some shopkeepers who profess to buy only from the makers. But in no single instance is there a manufacturer, *purely and only such*, who sells *only* to the shopkeepers, nor do we know of any one shopkeeper who buys from the makers, *and only from them*, all the goods he sells. There have been several instances of late years where old-established manufacturing businesses have turned their attention to the shops, but with what result? Immediately they had to carry other goods besides their own make, and thus they at once became factors. So far as our knowledge goes this has been a rule without an exception, and it does but emphasize the conclusion we have already arrived at on this subject. The simple fact is that this, like several other matters of which we have previously treated, was but an effort to make the best of bad times. Simultaneously with a declining trade various ideas were started and developed for its improvement, and the suppression of the middleman with his expenses and his profits was one of these. Nor have we yet seen the last of it. Every now and then we hear of fresh departures in this direction, and perchance here and there may be cases in which it is fairly successful. Quite recently has a well-known London maker sent a traveller out into the country, and we await the result of his experiment with interest. But of one thing we are assured, that this is not the grand panacea for all the troubles of the jewellery trade; this is not the one thing needful to place it in a position of full prosperity. For after all, through the years of bad trade, those manufacturers have thrived the most who have confined their dealings strictly to the wholesale houses, and our experience teaches that such is likely to be the case.

There is, however, one matter which the trade appears to have to a great extent overlooked. which would tend greatly to minimise the effects of the bad trade of which we talk so much. But our space for the present is filled, and we must leave the disclosure of this all-important secret till next month.

Manufacturer.

Birmingham, 20th June, 1890.

Formation of a Whitby Jet Syndicate.

On Tuesday evening, the 24th ult., a meeting of the employers and workmen of the Whitby jet trade was held in the Assembly Rooms, Whitby, for the purpose of discussing, and, if possible, devising some scheme for improving the present state of the trade. The large room was crowded to excess. Mr. E. W. Beckett, M.P., who presided, in the course of his remarks referred to the depressed condition of the trade, and said he feared it was now worse off than ever. In some quarters such a serious view of it was taken that it was apprehended that the jet trade of Whitby was threatened with extinction. They were met that evening to consider what should be done to rescue the jet trade from its present unsatisfactory position, to set it upon its legs again, and if possible to restore its former prosperity. Unquestionably, if the jet trade were to perish it would be a great misfortune and loss to Whitby, as it was one of the oldest trades in the town, and had made Whitby famous and prosperous in days gone by. Coming to the practical point, he asked what was the cause of the decay in their jet trade. Some might blame that craze for cheapness that had taken possession of the public in these latter days. In their rage for cheapness the public, rather than go without jet ornaments at all, would buy those of an inferior description, and this tendency had either driven the good jet out of the market or made the working of it unprofitable. It must be confessed that the fashion for wearing jewellery had rather gone out of late. The fashion was changeable and its caprices were innumerable, so that what had gone out to-day might come in again to-morrow, and he hoped that it would. They should try to attract the public by putting a really good article before them. They were met to discuss the present state of things, which they all deplored, and how that remedy was to be applied. They wanted a practical outcome from that meeting, and on the formation of a jet syndicate the first thing was that they should work unanimously together towards one particular end—the revival of the jet trade. Then they must all combine together in order to bring this movement to a successful termination. As an encouragement to them he would point out that Whitby held a very advantageous position in reference to the jet trade. Whitby jet was celebrated all over the world, and a movement of this description starting from Whitby must have an enormous influence. Occupying that position they had not so much to fear from competition. On the formation of their syndicate it was obvious that some system of trades marks must be adopted. Was it not possible to hall-mark jet in the same way as they hall-marked silver, which would protect the public against fraud and misrepresentation. They must find some solution of the problem how to supply the public with jet which was what it professed to be. Another great point to be insisted upon was that the workmen should combine together to protect themselves. They lived in days of combination, and it was hardly possible for a movement to succeed without it. This syndicate might assist its members in times of distress, and so prevent prices being driven down below a certain point. They wanted to save the workmen from being defrauded out of the just reward of their artistic skill and merit. Lastly, in these days they could not succeed without efficient advertising. He could assure them that he wished in every possible way to associate himself with their welfare and material interests, and nothing could give him greater pleasure than to be of some assistance to bring back the trade of former days, which was a source of much prosperity to the town.

Mr. Charles Bryan moved "That an association, to be called the Whitby Jet Jewellers' Association, be now formed for safeguarding and improving the trade." Mr. Isaac Langdale seconded the motion, which was supported by Mr. R. E. Pannett (who said what they needed was proper classification), Mr. J. Stevenson and Mr. Robert Harrowing. The last-named speaker said Whitby had a monopoly of this trade, and the men had it in their power to better their condition if the men were only true to themselves. The resolution was put to the meeting and carried unanimously.

Mr. W. Stonehouse also addressed the meeting.

On the motion of Mr. Peguero, seconded by Mr. T. Tose, Mr. Beckett was unanimously appointed president of the association.

Mr. T. Preston moved the appointment of a committee to make the necessary arrangements and to have the association duly registered, which was seconded by Mr. W. R. Pearson, and carried unanimously.

A vote of thanks to the chairman terminated the proceedings.

Diamonds in Amsterdam.

The State Department, Washington, D. C., has, says *The Jewelers' Weekly*, received from D. Eckstein, consul of the United States at Amsterdam, Holland, an interesting report upon the diamond industry of that city. The report will be published in the next volume of consular communications. By the courtesy of Worthington C. Ford, chief of the State Department Bureau of Statistics, *The Jewelers' Weekly* was given access to advance sheets of the report, from which the following extracts are made:

The diamond industry and trade experienced a great change in an unfavourable direction in the course of the last year. The owners of the large and small cutting establishments, of which there are at present a great number, as well as individual workmen, cleavers, cutters and polishers, who purchase, manipulate and finish the rough product on their individual account, and all others engaged in the industry, have had a hard time of it during the past twelvemonth. In short, the formerly, at times, so exceptionally prosperous industry of producing the brilliant out of the rough material witnessed a regular revolution.

After the discovery of diamonds in South Africa, from eighteen to twenty years ago, the proprietors of the then existing, but comparatively few, manufacturing establishments here, as well as the workmen in any way engaged in the turning out of the finished goods, amassed fortunes in many cases and in a brief period of time. This so remarkable state of affairs connected with the industry in question could not and did not last many years.

The number of factories speedily increased, and the attention of hundreds, if not of thousands, was attracted, and they learned the trade of either cleaving, cutting or polishing, and thus speedily augmented the number then employed in those occupations. Thus the fortune-making period was soon affected and terminated altogether after a few years.

During the past ten years or more, and up to a year or two ago, the business of producing the finished goods became greatly extended, and the industry generally assumed greater dimensions and importance. The demand for the goods kept step more or less regularly with the finished goods put upon the market. Prices fluctuated from time to time, but at no period very violently or suddenly, so at all times fair profits could be realised by the proprietors of the large and small cutting establishments, and workmen who turned out their own goods obtained paying returns upon their investments and for their labour, while other workmen employed by the manufacturers always made good living wages. This satisfactory condition of things came rather suddenly and unexpectedly to an almost complete stop in the course of 1889.

The operations in all diamond factories in this city were greatly curtailed during the year, great numbers of employees were discharged from time to time, and many of those retained were employed only part of the time. The wages paid for any and all classes of work were at considerably reduced rates compared with what was paid for corresponding work in former years. Workmen handling their own goods, of whom there are a very large number, could not dispose of them at such rates as would leave them even a fair compensation for their labour and anything as interest upon their investments.

It is easily explained what brought about so great and so unsatisfactory a change in all these matters. As by the discovery of diamonds in South Africa great benefits resulted to a goodly number of this city's population and indirectly to Amsterdam itself, so it would appear that now great injury is resulting from the co-operation of a certain syndicate which has and does at present control the diamond mines. This syndicate consists of a certain number of firms and persons residing in London, and it extends or limits the output of the mines at its will or pleasure, placing upon the market only such quantities of the "rough goods" as will command whatever price they see fit to ask for it. The rise in the prices of the rough as they stood at the close of the year 1889, as compared with what they were about a year before, amounted to over 75 per cent., as I am credibly informed. In the meantime all classes of finished goods have also advanced, but not so much by far as those for the rough material.

In consequence of this disproportion in the prices exacted for the rough material and those for the finished goods the diamond industry and industrials find themselves at the present moment in the suffering condition above described. This abnormal state of things is likely to continue to prevail, until either the prices for the rough material are reduced, or until those for the finished goods still further advance without at the same time affecting the usual demand for the article.

In the meantime the unfavourable situation of so many of the diamond operatives attracted considerable attention toward the close of the year. This was not to be wondered at, as the impoverishment of so numerous a class of the city's population deserves to be, and is regarded as a most regrettable matter. It was in consequence thereof that one of the principle banking houses at that time offered financial aid to workmen and manufacturers on a small scale who had finished goods on hand for which they could not realise such prices as they were actually worth or as would secure to them reasonably fair remuneration for their work in addition to the original cost of the rough. This relief was offered to be extended in such form and on such conditions as it was believed would accomplish the desired purposes, to a certain degree, at least. This assistance was proffered by the bank on or about December 1, and the actual terms upon which it was made are, as explained to me, and briefly stated, as follows :

The bank makes advances to the parties concerned in sums within a certain close margin of the previously ascertained market value of parcels of finished goods, to be deposited with or pledged to the bank. The goods can, at all proper times, be shown to intending purchasers, and when sold the sums advanced against them must be refunded, inclusive of the interest due in each case, which, as I am informed, is chargeable at the rate of 4 per cent. per annum.

However, as stated to me, transactions or loans under this arrangement were but few and unimportant during December, but it was anticipated that if the general situation would not soon change they would largely increase during the year.

The following statement exhibits the value of the direct exports of diamonds and precious stones from Amsterdam to the United States during the past five years, or from 1885 to 1889, inclusive, as ascertained from certified and recorded invoices at the consulate: 1885, 347,527 dols. 33 cents ; 1886, 1,378,542 dols. 77 cents ; 1887, 1,842,705 dols. 69 cents ; 1888, 3,141,024 dols. 57 cents ; 1889, 3,374,465 dols. 61 cents.

It will be observed from the above that the higher price which the article commanded during the past year did not deter American buyers and importers from making purchases and shipments as extensive as in former years, but that, on the contrary, they increased even during the year 1889, as compared with the year before.

But the important fact that large quantities of diamonds purchased in this market find their way to the United States without invoices for them being presented or legalised at this consulate must not be omitted to be stated, and therefore it is impossible to say what the actual value really is which represents the trade in the articles in question between this city and the United States.

The character of the goods, little bulk and great value, prevents all control or the exacting of the productions of all invoices for verification at this consulate. As it is, I can only say that I believe that a very considerable quantity of diamonds intended for the American market when purchased are sent or taken to London and Paris, and invoices for them are presumably legalised at the consulates general at those places.

During the depressed period the Netherlands Diamond Workers' Association published an appeal to the charity of the people, as follows :

"Fellow Citizens—By the Netherlands Diamond Workers' Association of this town, which consists of 600 members, our attention has been called to the sad condition in which, by consequences beyond their control, thousands of families are placed, whose heads up to the present had been earning their bread as clever diamond workers. No less than 7,000 of these workmen are without work, and at present there is no sign of a change for the better. Those who materially assisted in the prosperity of our town are in want of the necessaries of life—proper food, clothing and shelter. Most of them are unfitted to gain a livelihood in any other way.

"We therefore call upon you to assist them by your gifts till better times dawn. We ask everyone, of whatever religion, because we know that beside the opinions which divide us is the humanity which unites. It is hoped that also many outside Amsterdam will add their gifts to those of the citizens, for this town was never behindhand whenever assistance has been required in any part of the land.

"A committee will superintend the judicious distribution of the money."

To Restore Oxidized Watch Chains.—Oxidized watch chains or other jewellery look very nice while new. After exposure to humidity and other atmospheric influences they lose their pretty appearance. They may be restored in the following manner. First, they are burned yellow in the usual manner, and are then put into a bath containing 8 parts of muriatic acid and a very small quantity of white arsenic. The vessel in which the bath is kept should either be lined with lead or the articles should be in contact with sheet lead or lead wire. Beautiful colours appear upon the ornaments after one contact with the lead, and varying shades appear one after another, till at last they become grey. As soon as the desired colour is obtained the ornaments should be taken out of the bath, thoroughly washed in water and then dried in sawdust.

A Jewellery Guard.

THERE has always been more or less curiosity exercised, says the *Morning Journal*, as to the manner in which Tiffany and Co., the well-known jewellers, protected themselves from wholesale robbery and petty theft. Their whole success is summed up in one word—system. Throughout their vast establishment affairs are run in a groove, well oiled and of so perfect a nature that losses are well nigh impossible. A reporter visited the store yesterday and saw Mr. Hyde, who has charge of the watchmen employed in the building. On him rests the responsibility of guarding many hundreds of thousands of dollars' worth of property.

"I must impress you with one thing," he said, "and that is that the employees of Tiffany and Co. are from the outset supposed to be men of integrity. We have men here who have been with the firm for over thirty-five years, and in a number of cases whole generations are employed in the house."

Mr. Hyde dwelt at length on the honesty of the firm's employees and their many years of service.

"We are as well protected both in and out as it is possible to be. Exteriorly our building is positively fire and burglar proof. Only in case of a mob of 1,000 or more persons could entrance be effected to the building."

"You have watchmen outside as well as in?"

"Yes; but it is on those within that we principally rely. The men outside are so placed as to watch suspicious characters who may be lurking about. Inside we employ eight or ten watchmen. These are assigned to different sections on different floors."

"How do you know that the men do their duty?"

"By a simple contrivance known as a time clock. These clocks are placed throughout the building and must be wound at regular intervals during the night. In this way in the morning we are enabled to tell if each man has done his duty. Such means are, however, hardly necessary, as we place implicit trust in our watchmen."

Instead of mammoth safes weighing many tons, Tiffany and Co. place their diamonds at night in little iron compartments behind the counter. These are made of steel and solid masonry and are really as burglar-proof as other larger and heavier safes. The usual hour for closing is six p.m., when the diamonds and other precious stones are placed in the small safes. The many other cases containing thousands on thousands of dollars' worth of silver ware are simply locked. All the keys are then turned over to Mr. Hyde. Unlike many other large establishments carrying large and valuable stocks of goods, Tiffany and Co. place no offensive espionage over their employees. Each clerk is not suspected of being a criminal. In speaking on this subject, Mr. Hyde said:

"While the fact will not cause offence to honest men, I must say that every known offender against the house has been prosecuted, and there are now men in State's prison who regret their desire to defraud us."

"Then you have convicted dishonest employees?"

"Yes. But such cases are so isolated as to be unworthy of notice. A few years ago we had a young man who stole goods to a small amount. It was at once discovered and punished."

"How do you protect yourself against shoplifters and others of a peculating turn of mind?"

"Here again the beauty of our system is seen. A jewellery clerk becomes so skilled in time that it becomes almost impossible to rob him. For instance, suppose you wish to buy a diamond ring. It is not necessary in such a case for you to look at diamond necklaces; so the clerk simply places one tray of rings before you. Let me say right here that there is never a vacant place in any of our diamond trays. As soon as a piece of jewellery is sold it is replaced by a duplicate. As each tray is filled and as the faculties of the salesman are made acute by many years of experience, it is almost impossible to rob him."

As a further test of the employees of Tiffany and Co. an account of stock is taken each morning. This is done by the salesman who has charge of a department. It is possible under these circumstances to discover whether or not anything is missing half-an-hour after the store opens for business. Each article, be it ever so small, is entered and must be accounted for. If it is sold the books show that such is the case. If, on the contrary, it has been stolen—well, then there is an investigation and the store detective force is set to work. The three or four quiet unostentatious gentlemen who stand idly about, sometimes with and sometimes without their hats and overcoats on, are detectives. These are lynx-eyed, and nothing escapes their notice. In addition to the regular staff, a number of other Hawkshaws are employed during the holidays. Everything considered, the firm of Tiffany and Co., acknowledged to be the largest jewellery house in America, surrounds itself with remarkable safeguards. These, considering the amount of capital invested and the immense stock carried, are necessary.

Manufactured Precious Stones.

IN the long gallery on the top floor of the museum at Sèvres, says a contemporary, is a modest-looking glass case about two feet square, divided into compartments, each compartment containing a chemical. There is a blue substance, a red substance, and some dirty white crystals. In the last two compartments are two saucers containing small coloured stones.

These stones are genuine sapphires and rubies undistinguishable from the real stones by any chemical test, and only differing from them in the fact that they have been manufactured, not found; or, to use a technical expression, they have been produced synthetically. The other contents of the case are the substances used in making these precious stones. The rubies, of which there are about a dozen, are small, certainly not larger than a grain of wheat, and very uniform in size. They are in the shape of regular rhomboid crystals, that is, four-sided but not rectangular, and apparently flawless; but as they are rough and uncut it is not easy to detect flaws. The colouring, as is the case with all uncut stones, is somewhat dull, and might be described as a slaty lake.

The sapphires are much larger and vary in size, the smallest being about as large as a pea and the largest rather bigger than a hazel nut, but in crystallization they are very inferior to the rubies. They approach, it is true, the rhomboid form, but very roughly and with pronounced irregularities. One stone, for instance, has a body almost square with a spur projecting from it, the whole being almost like a saucepan in shape.

All the larger stones show distinct lines of cleavage, so that they would lose a large part of their weight in cutting. The sapphires are not of the dark blue type, but have a tendency to purple, being almost exactly the shade of the Ceylon stones. The colour would perhaps be best described as blue with a reddish sheen. There is a strong family likeness between the two classes of stone, and one could almost guess from their mere appearance that they had been produced by similar processes. In fact, the base of both rubies and sapphires is the same, and they differ only in colouring matter.

The base is silicate of alumina, or, in common language, a combination of aluminium and flint. In order to produce rubies the silicate is mixed with bichromate of potash, and the whole is kept at a certain temperature for several hours until the fusion is complete. For sapphires, cupric sulphate, or sulphate of copper, is substituted for the bichromate, but otherwise the process of manufacture is the same. The great difficulty is to obtain regularity of crystallization.

The rubies tend to break up into too small pieces, while the sapphires are rough and full of flaws. Apart from this the stones are not imitations, but reproductions of the natural jewels. In France it is illegal to sell them as rubies and sapphires without stating that they are artificial. But even if the sale were legal it is not likely that they would come into the market in sufficient quantities to depreciate the natural stones, owing to the difficulties in production yet to be overcome.

Clockmaking Industry in Dieppe.

ABOUT five miles from Dieppe is the town of Saint Nicolas d'Aliermont, where an important trade in clockmaking is carried on. Not only are clocks made there, but the skill of the workmen has been used in other directions. Commenting on this branch of business in France, Mr. H. W. Lee Jortin, the British Vice-Consul at Dieppe, in his last report to the Foreign Office, mentions that an important new industry has been started and developed at St. Nicolas by English enterprise and capital. It is the manufacture of electric incandescent lamps, in which business several English workmen are employed. The chief articles manufactured at St. Nicolas are movements for aneroid barometers, English gongs for clocks, movements for carriage clocks and regulator clocks, and even for chronometers. Eight-day and alarum clocks are an important part of the manufacture, as about 10,000 are turned out in a year. Mantelpiece and other kinds of clocks are made, but no watches. Escapements for these clocks come from the east of France. Workmen are employed at several places round about St. Nicolas, and in Dieppe itself; while in the latter town alone 200,000 dials are turned out yearly for St. Nicolas, Beaucourt, Paris, and even for England. This industry gives employment to about 1,800 men, women, and children; on an average they earn over 2s. a day, and a good workman can earn from 4s. to 8s. per day. The value of the manufactures is about 3,000,000 francs per year. This reference to clockmaking in France may be interesting, as the Earl of Derby is trying to revive the languishing industry of watch and clockmaking at Prescot, near Liverpool, to compete with the machine-made clocks and watches of America and the Continent. A smaller trade at Dieppe is the manufacture of chronometers for torpedo boats; it has been much encouraged by the French Government. Out of fifteen prizes given at the last competition, no fewer than six were awarded to the manufacturers in Dieppe; and out of ten which the Government bought, five were ordered from Dieppe. Each chronometer in gold case costs £20, in silver case £12.

Manufacture of Watch-Glasses.

SO little is known by the generality of the trade upon the above-named subject that the following, from a contemporary, will be of interest to a great many of our readers: A watch-glass is essentially fragile, and yet among the articles that are of everyday use no other is more exposed to knocks and accidents. A watch is left on the table, carried in the pocket with keys, pencil, toothpick and all kinds of nick-nacks. It is carried at the side suspended to a chain and exposed to all kinds of mischances. Our fathers, to whom the breaking of a watch-glass was a great expense, were more careful, but modern industry has spoiled us. They are produced so cheaply and in such abundance that in the breaking of a watch-glass we think more of the trouble of getting a new one than we do of the expense of replacing the glass.

These unlucky glasses are broken in such great numbers that the earth's surface would be covered with their fragments if they did not disappear by some inexplicable phenomenon, like that which happens to pins scattered by hundreds of millions, leaving no traces behind them. We estimate, without exaggeration, the number of watches in the world at 100,000,000. Each owner of a watch, if he were to break a glass only once in four years, would cause a breakage of 25,000,000 a year; the packing and transport would destroy almost as many. New watches would require two or three millions; watchmakers keep a large stock in their drawers, and chemists destroy a lot in laboratories. They are used for medallions, mariners' compasses, for children's watches—a specially dangerous career for the unfortunate glasses. No one, therefore can be astonished if we estimate the total consumption at the formidable figure of 100,000,000 a year. This number is, moreover, quite in harmony with the statements of the manufacture in other countries. Take one single instance: The manufactory of Three Fountains, near Sarrebourg, turns out 25,000,000 annually.

It was only after great struggling that these little things, which seem so simple at first sight, can be now bought at so small a cost. The first watches, the "Eggs of Nuremburg," were oval in shape, the glasses were cut on the stone in a block of crystal. Later, when they took a round shape, this costly process was again used for expensive watches, but for the others glasses were obtained by cutting, with a red hot ring, two caps in the small blown spheres of the proper size, and the millstone trimmed the sides. These protuberant glasses won for our grandfathers' watches the nickname of "onions," which they kept for a long time.

In the meantime, as the mechanism lost its bulk, good taste was not able to accept these big glasses, and went back to the glasses cut in the mill from the crystal blocks. These were the "cheves" glasses (a name derived from an old French word which means to hollow) and were very expensive. They tried to reduce the price by blowing small phials whose bases affected the form of the desired glasses. This foundation was separated and its edges finished on the millstone. But it was necessary to blow as many phials as glasses were required, and the price remained still too high.

The modern manufacture differs from the original form only in the perfection of its tools and better division of the work, but the principle has not altered. The workman gathers with the blowing tube several kilogrammes of glass, commences to blow with his mouth, and manages it so as to give the shape he wishes. Then he softens it by holding it to the door of the furnace, and, putting the end of the tube into communication with a reservoir of compressed air, he blows a big sphere. It is, of course, necessary to get the exact proportion of material at the commencement of the operation, accompanied by a particular twist of the hand and an amazing skilfulness.

The sphere ought to be produced without rents, in such dimensions that it is of the requisite thickness. Few of them are more than a metre in diameter. Out of these balls the workman cuts convex discs of the size he wishes. Formerly that was done by following the outline of a metallic disc with the end of an earthenware tube at white heat. Then the workman threw water over the glass, and the sudden contraction of the cold material detached the desired disc. To-day he uses the "tournette," a kind of compass furnished with a diamond in one of its branches. It is a delicate operation. The diamond having traced the circle, it is struck on the interior and exterior sides with a stick so that the piece may be detached. The following discs traced by the side of the last are obtained very easily. They are seized by the thumb, passed through the aperture already made, and two fingers placed above. An able workman will cut 6,000 glasses a day. The spheres are divided into several segments and so given out to the person that cuts out. In order to avert the loss of material the circles cut out touch each other and only leave as waste the very smallest possible quantity.

After the separation the glasses present themselves in the form of discs, more or less concave, following the thickness of the sphere which has yielded them. They proceed then to a moulding of their edges for the purpose of raising them sufficiently over the surface of the dial to leave a free circulation for the hands. There are two ways of doing this. The first is to place the discs over moulds of fine earth containing a receptacle of the form of the glass which is desired. These moulds are thrust in an oven, and when the material is softened by the heat a workman withdraws them, and with a plug of paper forces down the glass into the receptacle. In this the material which had become plastic stiffens.

It is necessary not only to polish the sides of the glass on the stone, but often to repolish it entirely. To avoid this inconvenience another process is used. The glass is placed over a mould of the same kind but of convex form, and of such dimensions that the edges of the disc pass all round it. In softening it in the oven the sides fall the length of the mould; a workman completes the operation by capping with a model in wood the entire system. It is only needful, therefore, to give the sides bevelled edges which will permit them to bind themselves to the frame. This operation is done on two stones, one to grind the glass and the other to repolish it. This last has even been simplified. They are cut out, bevelling from the disc before it passes to the oven. The heat which allows it to bend over the curved sides of the mould gives back to it at one blow the same kind of polish it lost on the stone. These different processes produce the ordinary glass, the old glass "chevé" which is to-day called by the trade "verre-chevé médium," although it is only hollowed so much as we have seen.

For costly watches thick glasses are made from which is taken away by the stone the convex outside and to which is given in consequence a flat surface; this is what is called "flettage." From some the central part of the convexity is only removed. This is "pointillage," which has only the aim to please the fancy, or to afford satisfaction to the buyer by showing him the thickness of glass which is given him, an advantage largely discounted by the fragility which results from the process. We cannot enter into all the details of this manufacture, but the reader of these lines who looks at his fragile watch-glass should know that it has passed through thirty-five workmen's hands before it reaches the watchmaker who sold it to him. The watch-glass which has been the object of the attention and labour of so many intelligent men surely deserves to be considered with a certain respect, and ought to have more thought given to it than it has had before.

Origin of the Diamond.

THE origin of the diamond, says the *Inventor*, has been a fruitful topic for speculation among scientists, hence many contradictory theories have been advanced and argued with some show of reason, but after all that has been said and written upon the subject we are still left greatly in the dark. Theories answer a good purpose, since they often lead the way to truth; but this is not all. They illustrate the ingenuity of the human mind in seeking to account for the methods nature takes for the accomplishment of her secret operations.

Some of the theories about the origin of the diamond are very ingenious and interesting, though the amount of truth they embody remains to be proved. It has been suggested that the vapours of carbon during the coal period may have been condensed and crystallized into the diamond, and, again, that the itacolumite, generally regarded as the matrix, was saturated with petroleum, which, collecting in nodules, formed the gem by gradual crystallization.

Newton believed it to have been a coagulated substance of vegetable origin, and was sustained in the theory by many eminent philosophers, including Sir David Brewster, who believed the diamond was once a mass of gum, derived from certain species of wood, and that it subsequently assumed a crystalline form. Dana and others advance the opinion that it may have been produced by the slow decomposition of vegetable material and even from animal matter. Burton says it is younger than gold and suggests the possibility that it may still be in process of formation, with capacity of growth. Specimens of the diamond have been found to inclose particles of gold, an evidence, he thinks, that its formation was more recent than that of the precious metal.

The theory that the diamond was formed immediately from carbon by the action of heat is opposed by another, maintaining that it could not have been produced in this way, otherwise it would have been consumed. But the advocates of this view were not quite on their guard against a surprise, for some quick-witted opponent has found by experiments that the diamond will sustain great heat without combustion.

Jules Jurgensen.

THERE is no nation which can more justly look with pride upon its commercial thrift and energy, says the *Jewelers' Circular*, than our rivals in the horological science, the Swiss. The history of horology in Switzerland is as thickly studded with names of men who have earned a deathless renown as the barren surface of the country is covered with frowning, snow-capped mountains:—Jacob Brandt, Jacques Henri Vaucher, Jonas Courvoisier Clement, Mathey Claudet, Jean Jacques, Jeanneret-Gris, Jean Frederic Leschot, Ferdinand Berthoud, Abram Louis Breguet, Francois Ducommun, David Henri Grandjean, Fritz Courvoisier and others familiar to every disciple of the craft, no matter on what part of the earth he may be seeking a livelihood. To these men is due the principal credit of having developed the fifteenth-century watch, clumsy in construction and irregular in performance, to the fine pocket chronometer of to-day, delicate and faultless in appearance and almost perfect in time-keeping. But the historian recording the progress of horology would be open to the charge of gross ignorance or injustice were he to omit the claims of Denmark to a share of the honours in the development of the science. These claims are based chiefly upon the achievements of that remarkable family of horologists, the Jurgensens, who for a century and a half have made watches at Copenhagen.

In this long line of artist-mechanics, the figure of Jules Jurgensen stands out in striking prominence. He was the son of Urban Jurgensen, who, during the latter part of the last century, made chronometers at Copenhagen, and who inherited a watchmaking business established by his ancestor in 1745. In the beginning of this century, Urban Jurgensen, with the object of extending his knowledge of horology, moved to Locle, Switzerland, where he became a prominent personage in horological circles, participating in a successful movement to suppress abuses owing to the lack of efficient patent laws, and perfecting many improvements in tools and methods of construction.

Jules Jurgensen, the maker of the world-renowned Jurgensen watch, was born at Locle on July 27, 1808. A year or two later Urban with his family returned to Copenhagen, where he remained until his death. As a young man, Jules worked at the construction of chronometers under the eye of his father, his spare time being devoted to the study of physics, mechanics, and astronomy. At the age of 27 years he returned to Switzerland; he afterwards visited Paris and London, where he improved his knowledge in the foregoing sciences. In 1834 he established at Locle a branch house of his father's firm, and devoted his attention principally to the construction of pocket chronometers, employing the various improvements in watch mechanism that he had conceived during his studies, the result being that marvel of excellence as a time-piece, the Jurgensen watch. The calibers used in these watches cannot be improved upon, while the escapements are eminently suitable for precise timing.

It may well be said of Jules Jurgensen that he contributed in a large degree toward the artistic development of horology in Switzerland. He designed more than 30 calibers, invented a thermometer which was warmly approved by the Academy of Sciences, draughted sketches of seconds and half-seconds, and constructed several astronomical time-pieces after his father's plans, introducing into them several adjuncts of his own invention.

He passed the last ten years of his life at Geneva, and died on December 17, 1877. His business descended to his son, Jules F. U. Jurgensen, who worthily maintains the high reputation of the name of Jurgensen.

What is Time?—What is Time? The shadow on the dial, the striking of the clock, the running of the sand—day and night, summer and winter, months, years, centuries; these are but arbitrary and outward signs—the measure of Time, not Time itself. Time is the life of the soul.—*Longfellow.*

Poetry in Bracelets.

SPEAKING of the "latest American notion," a lay contemporary is rather "down" on the æsthetic section of the fair wearers of the jewellers' productions, whose apparent caprices are, after all, good for the business of the trade at large. After slightingly alluding to the people who call a carpet "a perfect poem," and recognise a coal-scuttle as a "complete sonnet," it goes on to say:—The new craze, however, is an extension of the monotonous "Mizpah" to the whole range of literature in verse. There are to be legible mottoes from favourite authors; the silversmith setting with impartiality any line from any poet, minor or major, from the bard of the country paper up to the brightest luminary of intellectual Boston. The Bible and Shakespeare will suit serious young women; the blue-stockings of the Hub of the Universe will have Latin or Greek, perhaps Sanskrit, flashing from their wrists; while, as the news-writer informs us, the young lady of advanced culture will choose hers from Swinburne or Baudelaire. There are several advantages to the fair sex in this new fashion. For some occult reason, hopelessly obscure to the male mind, no woman ever thinks she has too many items of personal jewellery. If any man doubts this assertion he has only to send another brooch or bracelet to some kinswoman or intimate friend to find out that the lady who owns ten bracelets is always happy to get an eleventh, and that the dame who commands ninety-nine would be equally delighted to get one more. Under the new American plan there would be a perpetual excuse for changes and additions. A lady would say, "Oh! I am tired of seeing 'Who ever loved that loved not at first sight?' always before me; besides, I don't believe it, though I did once." For women not only delight in what is new, but have a greater capacity for getting tired of what is old than any other being on the face of the globe. A dress may be perfect in its beauty, its fit, its suitability; it may enhance the charm of the wearer and enchant her male friends; but, when once the fatal thought occurs that she has worn it four or five times already, then a change comes o'er the spirit of her dream. What was delicious the first evening it was put on, interesting on the second, pretty well on the third, and barely endurable on the fourth, becomes intolerable on the fifth occasion of its appearance. This love of variety will be fooled to the top of its bent when all the bracelets of the American belles are adorned with mottoes from the poets in vogue. For literary fashions change. There was a period when London rang with Philip van Artevelde; then came Bailey's *Festus*; anon Tennyson appeared, and finally Browning became the rage. If lettered bracelets were worn at those times a blue-stocking in society would have found reason enough for different mottoes always selected from the leading poet or poetess of the day.

Woman and her admirers might find bracelets with mottoes valuable aids to early conversation. At present, when a gentleman is introduced to a strange lady at a conversazione or a dance, he does not know how to begin. "There is no art to find the mind's construction in the face," as Shakespeare says. A girl with a massive brow may be an ardent flirt, while a fragile little laughing thing may have written three or four occult stories full of mystery and deep thought. Then who can tell at a glance whether the fair being before him is a bold Agnostic or a Ritualist who gets up at six in the morning to attend early service? It is not even possible to know beforehand whether a pair of witching brown eyes beam from the brow of a Home Ruler or a Unionist. The motto on the bracelet might therefore be of considerable use in giving the male adventurer through that dark continent—a strange woman's life and character—some light and leading as he begins his quest. Many a stammering youth fresh from Oxford or Aldershot is at a loss for words; but "May I see what is engraved on your bracelet?" would be a magnificent opening. Then the "consenting fair"—as the 18th century poets always called her—might lift a tiny hand displaying a pretty wrist and a shapely arm while the swain bent down to learn his lesson. Rising to the occasion, he could always inquire whether she agreed with the sentiment of the jewellery. Did she really think that "man's love was of man's life a thing apart"? Could he not persuade her to believe that there might be men whose "whole beings"—and so on? If the verse were very despondent he might combat it cheerfully; if it were too lively he might contest it, suggesting despair as the more interesting condition of the mind. Then the poet cited would offer ample opportunities for short allusions to his life, or, if the young man were particularly quick, to other and better quotations from his works. In short, the idea of these literary bracelets must have been invented by some benevolent person who sought to confer at the same time a sweet boon on three classes of human beings. If the fashion prevails he will succeed. Young ladies will be supplied with an unlimited excuse for demanding new decorations. Young men will always find something to say at the first start. Then jewellers will make their fortune by filling the market with pretty little articles sweetly combining poetry and craft. We shall also be enabled to test the taste of the women of two hemispheres when we find what poet is most laid under contribution for the metallic mottoes of the hour. We shall know whether Longfellow, Tennyson, or Browning, Shakespeare, Milton, or Pope bears away the palm as flashing most frequently from the wrists of Beauty armed with new weapons for the more thorough subjugation of Man. Perhaps, should the mania go to far, some economical artificer may strike out a bracelet with a sliding panel, so that the motto to suit the sex may change every day. Then the admirer, approaching timidly his ladyfair, might know by her selection the mood of the hour. She might flash upon him a grim Greek verse from Sophocles, or delight his eyes with a playful bit from Suckling, Herrick, Catullus, Anacreon, or Tom Moore. In fact, this movability of mottoes would answer to the precautionary arrangements of the Parisian goldsmiths. When a young lady of the gay city wishes to symbolise eternal devotion to a lover going away, she wins from him a bracelet with his initials secured on her wrist by a lock, so that it cannot be unclasped day or night without the special key, which is entrusted, of course, to the absent man. This seems a pledge of eternal fidelity. A Parisian jeweller, however, on being asked about it answered, "Well, sir, we do not say so at the time, but we always do keep a second key. You see, sir, young ladies change their minds, and they come asking to have it taken off. Then, instead of spoiling the gold, we produce the duplicate key and the thing is done."

There is another point of view from which this matter may be regarded. We live in an age of general censoriousness almost approaching an universal Inquisition. A certain class of critics scent horror in almost every page of the literature of the past, and would condemn us to a diet of dull histories, bad sermons, novels without love, and plays without sensations. One almost foresees a period when the London County Council, taking its walks abroad, will clear our shop-windows of the photographs of every actress unless she has been taken with a long cloak and a thick veil, and will arrest the President of the Royal Academy for allowing undraped statues at Burlington House. These worthies have dropped their plan for licensing all performers, and the alternative suggestion of numbering ballet-girls, so that the twinkle of their "honourable limbs" might not confuse their identity, has not yet been adopted by Lord Rosebery and his merry men. Still, these saints of the earth are prowling around us seeking what they may put down, and we never know when they may break out in a fresh place. The Bond Street shopkeepers had, therefore, better beware. The eyes of the county aldermen and councillors are on them, and if mottoes from Swinburne and Baudelaire are improperly exposed there may follow prosecutions and fines. Perhaps these well-intentioned gentlemen who have raised our rates and muddled our Metropolitan business may go further. At present they have a "high old time" of it, going about to all the music-halls of London to find out abuses; they are, in fact, the only married men in the Metropolis who can say to their wives that they go to these places not to be amused, but in the persistent pursuit of a sacred duty. When that kind of pleasure palls they may take a turn at general society. They may constitute themselves a committee of taste as regards the new fashion of bracelets with mottoes. At present, in society, if one sees a handsome young fellow sitting in a corner, holding a lady's hand for ten minutes at a stretch, one is not allowed to suppose an attachment. Oh, no! he is only telling her character from her palm. The same kind of excuse will attach to the inquisitors of the council, if, after having lengthened the skirts and purged the songs of the music-hall performers, they fly at higher game and study in society the jewelled literature of ladies' wrists. There were once Education Commissioners in Ireland who, in their books for boys and girls, changed Goldsmith's line "For talking age and whispering lovers made," by omitting "whispering lovers" and putting "social converse" instead. This might be a model for our London County Council in its war against all amusements and all literature that is not on a level with its pharasaical ideas.

Jet.

A SPECIAL correspondent of a contemporary having recently paid a visit to the Yorkshire Jet Holes in the neighbourhood of Whitby gives, in the following article, some particulars which will be perused with interest by many of our readers:—

This is not a learned essay on that bituminous mineral which takes its name from the small town anciently called Gages, on the river Lycia, from the banks of which it was originally obtained; no wading through the modulations which transformed the word "gagates" into "jet"; not a scientific disquisition as to the various forms of "black amber" found all over the world; but just the plain story of a visit to the "Holes" in the rugged cliffs of our Yorkshire coast, whence comes our now neglected Whitby jet.

While enjoying *dolce far niente* near the picturesque little fishing village of Staithes, some six or eight miles north of Whitby, I struck up an acquaintance with a Cleveland ironstone miner "out of work," a rough, honest Yorkshireman as one could wish to meet. In course of conversation, David—that was his name—told me how the mining trade was in a state of complete stagnation, and such of the miners as had not left the district were obliged to try their luck at the jet holes.

My curiosity was aroused. I soon learnt that the owners of the cliff land gave free permission to anyone who cared to dig for jet, claiming as a recompense one third of all the diggers might be fortunate enough to find. Also, I heard that the oft-disputed factor of luck held undoubted sway over the labours of these men; some having worked, day after day, for months, making great caverns in the cliff, some 20 or 30 yards deep, without one ounce of jet as their reward. Others had struck a vein which yielded £200 to £300 worth in a week.

Very little persuason was needed to induce my friend to take me round to some of these jet holes. He merely warned me that I should find the journey "a goodish bit tougher than I bargained for." He was right. My costume was hardly suitable for clambering along the side of jagged cliffs. Missing my fickle foothold meant certain death, for which I was not prepared. For half an hour, midway between the sea level and the summit of the cliffs, with eighty feet of perpendicular rock above and beneath us, we crept along, clinging to any projecting point and stepping from ledge to ledge, while the sea birds flew away in flocks, angrily and noisily resenting our approach. At length, within the bowels of the earth, we heard the regular heavy thud of a pick-axe, and having with difficulty rounded a promontory, we saw an opening in the cliff, about 7ft. in diameter, which crowned a sloping mass of shale. This shale had been displaced by the excavation, and formed a huge semi-cone with its base far below in the sea.

"So this is a veritable jet hole," said I. "Well, it's a hole," replied David, "but as for jet, I've never heeard o' none bein' f'und, thof Owd Abram's worked at it nigh on a year." In response to David's "Hillo!" "Owd Abram" appeared, pick in hand, and, after the usual introductory ceremony, I was conducted over the "hole." More than 30 yards into the solid rock had this old mole penetrated, not to mention numerous shoots from the main stem; and beyond keeping to the blue shale, his only guides as to direction were fancy, presentment, or caprice. Luck was the only science on which this unfortunate digger depended. Day after day he had toiled with pick and spade; occasionally doing a little blasting, sometimes having his progress impeded by huge masses of hard stone—"doggers" in the vernacular. Some of these weighed as much as 30 tons, and must be broken up before they can be removed; and as yet his industry had not been rewarded by one single ounce of jet. When we left "Owd Abram's" claim he was drilling, previous to blasting up a portion of his flooring at the extreme limit of his cutting. "Happen I'll drop across it this time," said he, cheerily. Truly "hope springs eternal." It is needed in the rugged breasts of unsuccessful jet-diggers.

Only a few yards further along the face of the cliff we encountered Robert Bagshaw—"Lucky Baggs," he is called—who was sitting in the sun like a great sandy rabbit at the entrance to his hole. This man had struck a big seam only a little time before our visit, and now had a coal-cellar, a pig-stye, and half his cottage kitchen filled with huge lumps of jet, awaiting a travelling purchaser. We wished to see some in the rock, just as it was found, but were informed that none was now visible. "If we cared to wait," said "Lucky Baggs," till he was through with his "bit of baccy," he was going to blast a "dogger" down, and he might drop across some then. We did wait. We witnessed the process of blasting, and we did see some jet in its natural bed, for this favourite of fortune actually dropped across another vein, the magnitude of which of course we did not stop to ascertain. What we saw looked like an irregular layer, varying from one to six inches in thickness, of such a shape and form as to leave no doubt that it had once been the wood of some tree or plant. The diggers, however, insist that jet is fossilised blood. Their probable reason for this is the ruddy appearance it presents when roughly cut or filed. Having seen the dark and the bright sides of jet hunting, and armed with some fragments generously bestowed by "Lucky Baggs," we made our way back to "Owd Abram's" claim, there secretly dropping a piece or two of jet in the hope that their discovery might cheer his old heart and stimulate him to further and, happily, more successful exertions.

Whitby jet is now sold at a miserably low price, about one-fifth of its value a few years ago. This, it is said, is because it is not now fashionable. Now, ye who talk loudly about encouraging our native productions, again affect jet jewellery, and so raise the price of this peculiar form of coal. By so doing you will indirectly lighten the lives, brighten the homes, and feed the starving families of many honest toiling Cleveland miners, who, in these direful days of trade depression strive to dig an existence from the hard and rugged cliffs of the Yorkshire coast.

Electric Welding.—A board of naval officers recently was ordered by the Secretary of the United States Navy to convene at Boston for the purpose of reporting upon the advisibility of generally adopting the Thomson electric welding process, with the view to using the machines of this company in the various navy yards and on board the Government cruisers, etc. This board met, and after several days' careful investigation made a unanimous report recommending the use of the machines by the navy in its various departments. In this report they state that the Thomson welding process can be found of great utility to the naval service, both on shore and afloat, for the following reasons: It can be used—(*a*) In welding breaks in rods without altering them in either length or shape; (*b*) For welding tubes; (*c*) For welding angles and shapes of intricate form; (*d*) For welding copper, brass, cast iron or other metals; (*e*) For heating metals for forging, tempering and upsetting; (*f*) For welding wire cables.

The Metallurgical Arts at the Paris Exhibition.

Read before the Members of the Franklin Institute by F. Lynwood Garrison, Delegate of the Franklin Institute.

(Continued from page 298.)

Copper.—Although the French are justly celebrated for their productions of various articles of this metal, with but one exception the exhibits were disappointing. This exception was the exhibit of the Fonderies and Laminoirs de Biache—St. Vaast Pas-de-Calais. It contained a number of large drawn seamless tubes, the largest being ten and one-half metres by thirty-four centimetres in diameter, another ten metres long, seventy centimetres in diameter, and six millimetres thick, and a short one three metres in length, one in diameter, weighing 1,800 kilograms; a number of vats or pans, one 2·45 metres in diameter, eleven metres in circumference, weighing 1,800 kilograms; another 1·40 metres in diameter, weighing 1,500 kilograms; another, three and one-fourth metres in diameter, 1·6 metres in depth, weighing 1,200 kilograms, thickness of metal, fifteen millometres. Two large sheets of copper, one three by three metres, thirty-three millimetres thick, weighing 3,000 kilograms, the other 8·40 by three metres, fifteen millimetres thick, weighing 2,900 kilograms. Considering the difficulty of working such large masses of copper, these productions are especially remarkable. The productions of this company in brass were almost equally as good. Messrs. Muller and Roger, of Paris, exhibited some excellent machinery castings in bronze, one cogwheel weighing 1,600 kilograms.

Bronzes (artistic productions).

For centuries the French have been celebrated for beautiful artistic productions in bronze; the exhibition was replete of such work of all sizes and degrees of fineness and beauty. Next to the French and Italians, the Russians, probably, produce the most artistic work in bronze. Their exhibit, however, was disappointing, and unless one had previously visited Russia and was familiar with their productions, the above statement would appear far-fetched. Messrs. Chopin, of St. Petersburg, are the most celebrated bronze founders in Russia, but their exhibit at Paris did them small credit, as most of the articles they exhibited were small, inferior, and their whole display poor in comparison to that in their show-rooms in St. Petersburg.

In this connection, it might be well to mention the remarkable display of M. Dalifol and Cie, of beautifully fine and artistic articles of malleable iron. It was, by far, the finest display of such productions I have ever seen.

Zinc.—About the best and only extensive display of articles and products made from this metal, was made by the great Société de la Vieille-Montagne in the Belgian department. This establishment is the largest of the kind in the world, and one of the oldest on the continent. The works produced last year 52,426 tons of crude zinc, 48,545 tons of rolled, and 8,109 tons of zinc-white. The profits, for the year 1888, were 834,415 dols., of which 284,595 dols. was applied to their pension fund. The exhibit, although making an excellent display of zinc productions, was of such small dimensions that it did not convey to the general public any idea of the wealth and importance of the company. The principal works and offices are located at Angleur, in Belgium. Their other Belgian works are at Tilff (rolling mills), Valentin-Cocq (foundries and zinc-white works), at Welkenraedt are the calamine, blende, lead mines and roasting furnaces, at Schmalgraf-Fossey are mines, metallurgical works and machine shops. In Germany, at Lüderich, blende and galena mines; Steinbruck construction works; Immekeppel, Castor, Colombus, Neu-Moresnet, Nicolaus, Phenix, Weisloch, Borbeck, Oberhausen, mines foundries, metallurgical works, machine shops, etc. In France, Levallois-Periet, zinc-white works; Bray and Dangu, rolling mills, etc.; Viviez (Aveyron) foundries; Panchot (Aveyron) and Haumont (Nord) rolling mills, etc.

In Algeria and Tunis, calamine, blende, and lead mines. In Sweden, at Ammeberg, zinc, copper, cobalt mines, roasting furnaces and machine shops. In Sardinia, calamine mines and machine shops. In Spain, several agencies for the exportation of minerals.*

This company manufacture zinc in nearly all its commercial forms, extra pure, a next grade for uses in the arts, zinc-tin, zinc for galvanizing; zinc-white, various oxides, and silicates for paint, etc.; rolled zinc, sheets for roofing purposes, electrolytic piles, etc.

One of the most interesting exhibits in the French department was that of the Cahaignes process, for the manufacture of chemically pure zinc. This zinc seems to be particularly well adapted for voltaic batteries. Judging from the reports of various chemists that have examined the metal, it appears to be all that is claimed for it; namely, perfectly free from copper, lead, arsenic, sulphur, silicon, etc.

Tin.—I did not observe any notable exhibits of tin, tinned articles or tin-plate. In several instances, however, I observed decorated and stamped articles made of tin-plate, and I understand that this decoration and stamping into cans for preserved fruits, ornamental boxes, etc., has become quite an extensive industry in France.

The French have manufactured more or less tin-plate for a great many years. The first works appear to have been started at Mansvaux, in Alsace, about the year 1714; this was several years before the industry was established in England and Wales. The successful works started at Mansvaux, in Alsace, were followed by those of Bains, in Lorraine, in 1733; Impy, near Nevers, in 1745; and Morambeau, in Fanche Comte, 1751. Ten years ago the French works produced over 300,000 boxes of tin and terne† plates; I have been unable to obtain any accurate estimate of the present production, but I think it is about 500,000 boxes. France produces no metallic tin; it is all imported from Australia or the Straits of Malacca. I believe little or none comes from Cornwall.

Gold.—There were numerous displays of gold ore, etc., from several of the South American states and the French and English colonies. In some instances, the methods of mining, concentrating, and smelting the ore were illustrated with models and drawings. Excepting the numerous, and in several instances magnificent, displays of jewellery, the only other interesting exhibit of which should properly come under the head of gold and gold productions, was that of the Comptoir-Lyon-Alemand. They exhibited what was claimed to be *chemically pure gold;* that is, as I understand it, 1,000 parts fine. I do not believe it is possible to prepare gold *absolutely pure.* The purest of which I have any knowledge, was prepared by W. C. Roberts, Chemist of the Royal Mint in London.‡ He succeeded, by a most refined and complicated chemical process, in producing the gold 999·96 parts fine. The exhibit of this company included some excellent samples of gold foil, sheets, wire, etc.

Silver.—The exhibits of silverware were numerous, and in many cases interesting and beautiful The French and English silversmiths made a particularly good showing, but so far as I am aware, they exhibited no novelties, either of design, finish, or workmanship. The best, most interesting, and novel exhibit of silverware was undoubtedly that of Messrs. Tiffany, of New York. Americans have long been celebrated for their *repoussé* work in silver, and one could not help observing that the exhibits of this kind in the American department far exceeded those in any of the other departments in workmanship and beauty. Messrs. Tiffany exhibited a number of novelties, that is as far as America is concerned, for I believe they are the first Americans that have produced any enamelled and nielloed silver. The art of enamelling silver is a very old one, having been known to the Greeks, and it is probably from this source, through the Byzantines and modern Greek Church, that the Russians have derived the art. Outside of Russia, it seems to be almost one of the lost arts, although I believe the French, Italians, and Swiss produce some small amounts.*

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* A very good and descriptive article on this company and its works was published in *Le Génie Civil*, September 28, 1889.

† Terne plates are coated with an alloy of tin and lead.

‡ *Fourth Annual Report of Royal Mint*, 1874, p. 46.

The art of enamelling consists essentially in laying powdered glass of different colours over a prepared metallic surface and then heating in a furnace to fuse and unite it with the metal. The cloisonné enamel is made by soldering filigree bands to the surface of the metal, and then filling these enclosures with the fused glass. When the metal is sufficiently thick, the cavities to hold the enamel are cut or dug out of the metal; this kind of work is known as *champlére.*

The art in producing on silver what is known as *niello* designs, seems to be, like enamelling, almost one of the lost arts, for, as far as I know, with the exception of a small amount made by Tiffany and Co. for the exhibition, none is produced outside of Russia at the present time. Like enamelling, the art consists essentially in fusing into an excavated design on the surface of the silver, an alloy made of silver, copper and lead, the lead constituting about fifty per cent. of the whole.

Messrs. Tiffany's exhibit contained some excellent samples of the oxidized and etched silver. The so-called oxidized silver is, in fact, nothing but a treatment of the articles to a hot solution of sulphide of potassium until they acquire a sufficiently dark colour. The various parts are then brushed or burnished to produce the different shades. The brownish tints are produced with chlorine.

The etching on silver is produced in the same way as on iron or steel, that is, by tracing the design on the surface coated with wax and submitting the exposed parts to the action of nitric acid. Etching, and the so-called oxodizing of silver articles is quite a common practice, and productions of this kind were common in a number of the departments.

The Comptoir-Lyon-Alemand exhibited an interesting collection of silver ingots, bars, sheets, ribbon wire, etc. They also claim to have silver 1,000 fine; but, like the gold, I do not believe it is possible for them, or anyone else, to obtain such a degree of purity. I have never heard of silver more than 999·9 parts fine. Excepting numerous displays of silver ores, etc., I observed nothing else of especial interest under this head.

Platinum.—The best display of articles made of this metal was that of Messrs. Johnson, Matthy and Co , Hatton Garden, London. It consisted of large retorts, stills and laboratory utensils, several large nuggets of native platinum, and good-sized *ingots* of palladium, indium, rhodium and ruthenium. There was also a large jar filled with granules and pellets of osmium (osmiamic acid probably). Metallic osmium cannot be cast into ingots, for, as far as I am aware, it has never yet been successfully fused. When heated to a temperature at which indium is fully melted, it evaporates and deposits in the form of a black powder on a cold surface held in the vapour, whilst it takes fire in the air, and forms the tetroxide. The Comptoir-Lyon-Alemand, before referred to, exhibited specimens of platinum in the various forms of foil, sheets, ribbon, wire, etc.

Nickel.—There were several interesting displays of pure nickel articles in the various French departments. In the New Caledonian exhibit I observed a bowl of pure hammered nickel, all in one piece, 40 centimetres in diameter and 17 centimetres in depth, the sides being about one millimetre in thickness. Also, two large bars of pure nickel, 2 centimetres in diameter by 40 in length, together a somewhat extensive display of pure nickel in sheets, ingots, etc. I understood that all these articles were made in the colony from the large deposits of nickel ore (garnierite) occurring there.

Messrs. Bredeville and Paturel, 5, Rue Mazet, Paris, had a large and exceedingly interesting exhibit of kitchen and laboratory utensils made of pure nickel. In regard to the use of pure nickel and nickel-plated culinary utensils, it should be observed that it is well known that acids have a more or less solvent action on nickel and on nickel plating, and inasmuch as the use of nickel and nickel-plated kitchen utensils is becoming general in France and Germany, it is a matter of serious moment to determine what would be the effect upon the human organism of the nickel which may find its way into the food prepared in such vessels. An investigation, having this purpose in view, was made a few years since by Geerkens, who affirms that as much as one-half gram of nickel may be taken into the stomach, and repeated a long time, without producing any noticeably bad effects. When it is considered that the quantity of nickel which, by any probable means, could find its way into food prepared in nickel vessels, would only be a very fractional part of this quantity, there would seem to be no grounds for uneasiness in the use of the same, especially where the same precautions are used as in the case of copper utensils: that is, thoroughly cleansing them and avoiding the storing of food in them.*

Nickel vessels are found very useful and convenient in chemical manipulations, being quite as good as silver, and, of course, much cheaper. Nickel, indeed, is slightly attacked by melted potash, but so is silver. Nickel crucibles have also the great advantage of melting at a much higher temperature than silver; it frequently happens that inexperienced chemists melt their silver crucibles in heating them in a gas flame, but such an accident is not to be feared with nickel crucibles.

Ferro-Nickel.—The French Ferro-Nickel Company, depôt 17, Rue du Pont-aux-Choux, Paris, works Lizy-sur-Ourcq (Seine-et-Marne), exhibited pure malleable nickel, ferro-nickel, nickel steel. They also claim to produce an alloy specially well adapted for covering small rifle-balls. This alloy, ferro-nickel, is attracting considerable attention, and the interesting results obtained with it demand our close attention. I have, therefore, taken the following details from a paper on the subject by Mr. James Riley, of Glasgow, published in the *Journal of the Iron and Steel Institute*, May, 1889.

The alloy can be made in any good open-hearth furnace working at a fairly good heat. The charge can be made in as short a time as an ordinary "scrap" charge of steel—say about seven hours. Its working demands no extraordinary care; in fact, not so much as is required in working many other kinds of charges, the composition of the resulting steel being easily and definitely controlled. No special arrangements are required for casting, the ordinary ladles and moulds being sufficient. If the charge is properly worked, nearly all the nickel will be found in the steel—almost none is lost in the slag, in this respect being widely different from charges of chrome steel.

The steel is steady in the mould, it is more fluid and thinner than ordinary steel, it sets more rapidly, and appears to be thoroughly homogeneous. The ingots are clean and smooth in appearance on the outside, but those richest in nickel are a little more "piped" than are ingots of ordinary mild steel. There is less liquidation of the metalloids in these ingots, therefore liability to serious troubles from this cause is much reduced. Any scrap produced in the subsequent operations of hammering, rolling, shearing, etc., can be remelted in making another charge without loss of nickel. The importance of this fact will be at once appreciated, especially by users of articles made of this metal, seeing that scrap and old articles will have a value for remelting in proportion to their contents of nickel.

No extraordinary care is required when reheating the ingots for hammering or rolling. They will stand quite as much heat as ingots having equal contents of carbon but no nickel, except perhaps in the case of steel containing over twenty-five per cent. of nickel, when the heat should be kept a little lower and more care taken in forging.

If the steel has been properly made, and is of correct composition, it will hammer and roll well, whether it contains little or much nickel; but it is possible to make it of such poor quality in other respects that it will crack badly in working, as is the case with ordinary steel.

In endeavouring to obtain a correct idea of the value or usefulness of alloys of nickel and iron or steel, we shall find it of use to consider their behaviour under tensile and other mechanical tests, and if these were sufficiently numerous our task would not be a very difficult one.

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* The Chinese and Japanese produce a good deal of *cloisonné* on bronze and brass, but, as far as I am aware, none on silver.—F. L. G.

*See *Report on Nickel, U.S. Mineral Resources.* Williams. 1883 and 1884.

If it be remembered, however, that in the composition of nickel steel we have present nickel and manganese and iron, with carbon, silicon, sulphur, and phosphorous, and that even a very small difference in contents of some of these has a considerable influence on the character of the alloy, it will be evident that several series of tests (involving a very large number of separate experiments) are necessary to a full investigation. For instance, we all know the effect of very small increments of carbon in steel; hence, to estimate correctly the influence of the addition of nickel, the carbon (as well as manganese and other contents) should remain constant. Then that contents of nickel should be constant and the carbon, etc., varied. Further, that the subsequent treatment of all the products should be identical in every particular.

No. 1.—Tests of Steel with Varying Contents of Nickel.

Mark.	Composition Per Cent.			Tensile Strength as Cast.					Tensile Tests as Cast and Annealed.					Tensile Tests as Rolled.					Tensile Tests as Rolled and Annealed.					Remarks.
	Ni.	C.	Mn.	E. L.	B. S.	Extension Per Cent. in		C. A.	E. L.	B. S.	Extension Per Cent in		C. A.	E. L.	B. S.	Extension Per Cent. in		C. A.	E. L.	B. S.	Extension Per Cent. in		C. A.	
						8 in.	4 in.				8 in.	4 in.				8 in.	4 in.				8 in.	4 in.		
	per ct.	per ct.	per ct.	tons.	tons.			per ct.	tons.	tons.			per ct.	tons.	tons.			per ct.	tons.	tons.			per ct.	
1,	1·0	·42	·58	Test-piece defective.					27·3	54·6	—	1·5	9·5	32·1	57·6	—	11·0	24·0	30·1	55·1	—	18·7	45·0	
2,	2·0	·90	·50	Too hard to machine with musket-steel. Makes a fine tool tempered at dull red in boiling water.																				
3,	3·0	·35	·57	19·8	34·9	—	2·5	5·6	24·0	34·9	—	2·5	9·0	31·4	51·0	—	20·3	37·0	28·0	48·5	—	20·3	42·0	
4,	3·0	·60	·26	—	—	—	—	—	—	—	—	—	—	29·4	51·5	9·0	10·1	9·0	30 3	42·9	7·5	9·0	12·0	
5,	4·0	·85	·50	Too hard to machine with musket-steel. Makes a fine tool tempered at dull red in boiling water.																				
6,	4·7	·22	·23	—	—	—	—	—	—	—	—	—	—	25·1	40·5	17·75	23·4	42·0	28·0	40·6	20·0	25·0	44·8	Average reduced by one piece, giving low result.
7,	5·0	·30	·30	—	—	—	—	—	—	—	—	—	—	30·0	46·4	10·0	12·5	22·5	28·0	42·6	15·0	17·5	18·5	
8,	5·0	·50	·34	—	—	—	—	—	—	—	—	—	—	31·1	52 0	14·0	15·6	14·0	32·5	46·8	13·5	14·0	17·0	
9,	10·0	·50	·50	Too hard to machine. Makes a good cutting tool when tempered in cold air-blast.																				
10,	25·0	·27	·85	—	—	—	—	—	—	—	—	—	—	38·2	51·4	10·5	11·7	—	12·75	45·8	29·0	30·0	28·6	
11,	25·0	·82	·52	—	—	—	—	—	—	—	—	—	—	22·0	47·6	43·5	47·6	60·0	15·1	42·1	40·0	45·3	43·6	
12,	49·4	·35	·57	—	—	—	—	—	—	—	—	—	—	20·5	37·4	—	12·0	24·0	21·0	37·0	—	20·0	29·0	

E. L. = Elastic limit. B. S. = Breaking strain. C. A. = Contraction of Area.

In Table No. 1 there are several points of interest which it is desirable to notice.

(1) In No. 6 test the carbon present (0·22) is low enough to enable us to make comparison with ordinary mild steel, which would give (when annealed) results about as follows: E. L. sixteen tons, B. S. thirty tons, extension twenty-three per cent. on eight inches, and contraction of area forty-eight per cent. Therefore in this case the addition of 4·7 per cent. of nickel has raised E. L. from sixteen to twenty-eight tons, and the B. S. from thirty up to 40·6 tons, without impairing the elongation or contraction of area to any noticeable extent. In No. 3 test somewhat similar results are found, with an addition of only three per cent. of nickel, combined with an increase of the carbon to 0·35 per cent.

No. 2.—Torsion Tests.

Mark.	Number of Twists in 3-inch Length.	Diameter of Bar 1 inch Lever 1 foot long. Weight in Pounds.		Condition.	Composition Per Cent.			Remarks.
		Elastic Limit.	Breaking Strain.		Ni.	C.	Mn.	
1,	$1\frac{7}{8}$	857	1,849	As hammered.	1·0	0·42	0·58	No. 1 Sample in No. 1 Table (unannealed).
2,	$2\frac{1}{8}$	677	1,507	,,	5·0	0·30	0·30	,, 7 ,, ,, ,, ,,
3.	$1\frac{3}{4}$	665	1,729	,,	3·0	0·35	0·57	,, 3 ;; ,, ,, ,,
4,	$1\frac{7}{8}$	621	1,493	,,	4·7	0·22	0·23	,, 6 ,, ,, ,, ,,
5,	$2\frac{5}{8}$	553	1,554	,,	50·0	0·35	—	
6,	3	510	1,950	,,	25·0	0·27	0·85	,, 10 ,, ,, ,, ,,
1A,	$1\frac{7}{8}$	697	1,809	Annealed.	1·0	0·42	0·58	,, 1 ,, ,, ,, (annealed)
2A,	$2\frac{3}{8}$	653	1,485	,,	5·0	0·30	0·30	,, 7 ,, ,, ,, ,,
4A,	$2\frac{2}{8}$	652	1,443	,,	4·7	0·22	0·23	,, 6 ,, ,, ,, ,,
6A,	5	360	2,100	,,	25·0	0·27	0·85	,, 10 ,, ,, ,, ,,
7,	1 15-16	601	1,689	,,	—	0·51	—	47·2 tons per square inch, Siemens steel.
8,	1 9-16	601	1,697	As hammered.	—	0·51	—	50·4 ,, ,, ,, ,,
9,	$3\frac{1}{8}$	445	1,229	,,	—	—	—	30·1 , ,, ,, ,,

(2) In Nos. 2 and 5 tests there is extreme hardness, due in part to the large quantity of carbon present, but also to the presence of nickel in addition. In No. 9 test, with the carbon very much reduced, this characteristic of hardness is intensified by the increase of nickel to ten per cent.

This quality of hardness obtains as the nickel is increased, until about twenty per cent. is reached, when a change takes place, and successive additions of nickel tend to make the steel softer and more ductile, and even to neutralise the influence of carbon, as is shown in No. 11 test, in which there is twenty-five per cent. of nickel and 0·82 of carbon. In this matter of hardness, due to increased increments of nickel, there is some resemblance to manganese steel, as described in Mr. Hadfield's admirable paper.*

(3) In the twenty-five per cent. nickel steel, there are some peculiar and remarkable properties. In the unannealed specimen, the B.S. is high and the E.L. moderately so; but in the annealed piece, while the B.S. remains good, the E.L. is very greatly reduced, down to one-third of the B.S. Again, in both cases, the ductility as shown by the extension before fracture is marvellous, reaching forty per cent. in eight inches. Another feature (clearly brought out in tests Nos. 10 and 11, most in No. 10, by the small contraction of area) is that this elongation is nearly uniform throughout the piece.

Table No. 2 gives results of torsion tests.

In the right-hand column, headed "Remarks," is given the number of sample or test in Table No. 1, for reference as to tensile strength, etc.

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* Read before the Institution of Civil Engineers, London, February 28, 1888.

The torsion tests have been made on the steel in the condition in which it left the hammer, and also after having been annealed.

Mr. Riley says : I have arranged both classes in what we consider order of merit, having regard to all the three qualities of B.S., E.L., and ductility, as shown by number of twists borne by each. It is satisfactory to find that to obtain the best results it is not necessary to use the steels rich in nickel, as only one per cent. is present in that which stands first in both classes.

There are several interesting points in this table to which I would ask your consideration. (1) At the foot of it I give results of torsional tests on Siemens steel. Nos. 7 and 8 are tests of the same steel annealed and unannealed, having a tensile strength of 47·2 and 50·04 tons respectively. A comparison of these two shows a very slight improvement in ductility due to the annealing. Now, compare them with No. 9, which is a test of ordinary mild steel of thirty tons tensile strength, and it will, I think, be concluded that it would be better to sacrifice some of the ductility shown by the greater number of twists, in order to obtain some of the greater strength shown in the higher E.L. and B.S. of Nos. 7 and 8. It has become common to order propeller and other shafts of mild steel, but I am inclined to the opinion that their resistance to both stress and wear would be increased by the use of stronger steel, while still leaving an ample margin of ductility. But this is incidental.

(2) I would ask you next to compare the results obtained with the ordinary steel with those of the nickel steel, and I think there will be no hesitation in deciding that there will be a very great advantage gained by the use of the latter—advantage either in reduction of scantling or in increased strength and ductility.

(3) It is interesting to notice how very closely this series of tests confirms those in Table No. 1, the E.L. and B.S. in both annealed and unannealed samples corresponding, and having the same relation to each other in both systems of tests, while the number of twists corresponds closely to the ductility as measured by extension in the tensile tests.

There are a few other properties of these alloys to which I will briefly refer. The specific gravity of nickel is given as 8·66 (we make it 8·86) ; that of ferro-nickel, if twenty-five per cent. nickel, 8·08 ; that of ten per cent. nickel, 7·866 ; that of five per cent. nickel, 7·846 ; while the mean of our results of hammered steel is 7.84.

The whole of the series of nickel steels up to fifty per cent. nickel take a good polish and finish, with a good surface, the colour being lighter with the increased additions of nickel.

(To be continued.)

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

By Dr. C. A. Bucklin.

(Continued from page 300).

In our last, says Dr. Bucklin, continuing his series of articles in the *Jewelers' Circular*, I finished the consideration of the various difficulties encountered in the selection of lenses for near and distant vision with the myopic eye. The description given thus of ocular defects have been, perhaps, painfully original. In the consideration of hyperopia I propose to follow to some extent the article written by F. C. Donders, and published by the New Sydenham Society of London, in 1854.

An eye is emmetropic when, with the eye in a state of perfect rest, the refractive system will cast a distinct picture on the retina, of objects which are sufficiently distant to make the rays of light coming from them parallel. The focus of the eye may lie in front of or behind the layer of rods and cones. In the first place we have *myopia;* in the latter case it is *hyperopia.*

Myopia is a condition which has long been known and has been very closely considered. Hyperopia as it generally occurs was, on the contrary, until quite recently almost entirely overlooked. At least, its nature and results were not recognised. Once discovered and understood it quickly revealed all its mysteries, and gave the solution of a number of phenomena whose origin had until then remained enigmatical. Thus the most frequent source of asthenopia and the almost exclusive source of convergent strabismus was founded on this anomaly.

It is evident that the hyperopic eye is one the diameter of which is too short for its dioptric system ; this necessitates the use of the accommodation for all distances to prevent the retinal image from falling behind the retina. This muscular struggle which is constantly in use for the purpose of increasing the strength of the lens produces fatigue, and the symptoms of this fatigue are called accommodative asthenopia. These excessive requirements of accommodation also disturb the natural relations existing between the fixation of the eyes on a common point and the accommodation. This disturbance causes what is known as muscular asthenopia, the efforts to overcome which difficulty frequently causes the individual to discard binocular vision. Not being able to fix with both eyes, he fixes with one and draws the other eye in toward the nose until the required amount of accommodation has taken place in the fixing eye. When an individual can learn to do this without being annoyed by double vision, he is said to have learned to look cross-eyed or developed convergent strabismus as the result of his hyperopia. If he cannot learn to fix with one eye and ignore the visual impression of the other he will not look cross-eyed because he has not been able to learn this trick. He will therefore continue to suffer from muscular asthenopia, which difficulty the development of convergent strabismus entirely obviates.

Hyperopia may be acquired or original. The acquired hyperopia is the result of a lost lens or the general shrinking of the tissues of the globe with advancing years ; this form of hyperopia commences to develop after the age of fifty years. The original hyperopia, which is always of a stationary or decreasing quantity till the age of 50 years, commences to increase slowly at that age. Hyperopia appears to be the natural condition of the eye in most of the lower animals, and we also find that the majority of young people are slightly hyperopic. The hyperopia in most instances disappears as the eye becomes more perfectly developed with advancing years.

Hyperopia of a high degree is usually hereditary. It is easily traced as existing for several generations by the statements of patients regarding the number of ancestors who were cross-eyed ; for an example, an aged person may distinctly remember two generations before him in which cross-eyes were a common defect, and he may have two generations living who show the defect. I have been greatly amused in tracing hyperopia for generations back by family photographs, which show decided convergent strabismus as being a family defect. The public very generally believe that convergent strabismus is an inherited defect, while in fact it is the hyperopia producing the defect which is inherited, and not the resulting symptom of strabismus.

In hyperopia the eye has never been sufficiently developed to become of the proper length. For the above reasons the acuteness of vision in hyperopia will be found to vary widely. The eye may be faulty in its development regarding length, but the retina may be perfectly developed ; in that case the acuteness of vision for degrees of hyperopia as high as $\frac{1}{5}$ will be $\frac{20}{20}$ +.

In most instances, however, the faulty development causing the hyperopia also extends to the retina, and the acuteness of vision in high degrees of hyperopia cannot be improved in a satisfactory manner by glasses. Great difficulty has been encountered in selecting proper lenses for the correction of hyperopia. The person having a high degree of hyperopia in many instances will refuse to accept during the trial convex lenses of any power. They may accept very weak lenses which are not of sufficient strength to relieve their annoying asthenopia. Hyperopic eyes obliged to strain their accommodation in order to see distant objects may involuntarily keep up the tension of the accommodation even when the proper glasses render this not only superfluous but undesirable for acute distant vision.

Donders started with the conclusion that from the strongest convex glasses through which distant vision was still accurate, he could deduce the degree of hyperopia. He however discovered that this was not always so, by discovering that at a later period the same person accepted convex lenses of greater strength than they had previously accepted. This discovery led to his experimenting with atropia on the refractive condition of hyperopic eyes. He found that the value of hyperopia in young persons was likely to be very much under-estimated. These experiments were the basis of many enthusiastic discussions at later periods.

I rarely find a hyperopic person who has no tendency to look cross-eyed, who cannot by patience and care be induced to accept lenses of sufficient strength to relieve all his asthenopic annoyances. I give them plenty of time, and am not discouraged at spontaneous remarks as "I can't see any better with that glass," etc., or "I can see much better without these glasses." I tell them to take time and try, that I do not expect them to see better, and that I only wish to know if they cannot see nearly as well as they could without the glasses. They will usually relax their accommodation in a few minutes, and accept a fair correction if you only give them a little time.

Cross-eyed hyperopes require the full effect of atropia, or one who uses the ophthalmoscope with great skill. Atropia is, however, the most reliable. A few cases are encountered who have severe asthenopic symptoms but who will not accept any glass, notwithstanding a high degree of hyperopia is the cause of all the annoying symptoms; these cases must also be treated with atropia, but I must state that in my personal experience I have found very few of this last class of cases. They usually accept, with time and encouragement, sufficiently strong convex lenses to relieve their asthenopic symptoms and make them comfortable. Persons with very high degrees of hyperopia squint the lids together like a myope; they usually state that they are very myopic and wish concave lenses for its correction. Under the above circumstances it is surprising to see great improvement take place in the acuteness of vision by the use of convex lenses as high as $\frac{1}{5}$.

Persons having very high degrees of hyperopia also hold observed objects very near, which is another symptom which leads to the conclusion that they are myopic. The reason for the above peculiarity is as follows: The hyperopia is of such a high degree that the efforts of accommodation produce no appreciable benefit in the improvement of vision; consequently they are not tempted to try for distinct retinal images. They hold the work very near for the purpose of receiving more intense illumination for the object. The illumination of an object decreases as the square of the distance increases, which explains why in excessive hyperopia there is an inclination to hold the work very near.

The following table gives the shortening of the eye-ball necessary to produce certain degrees of the anatomical error of hyperopia. It must be remembered that the glasses worn by an individual having hyperopia do not necessarily correspond to the amount of the error.

Table showing the amount of hyperopia and the shortened axis necessary to produce it.

Hyperopia.	Straightened Axis.	Hyperopia.	Straightened Axis.
$\frac{1}{50}$	0·21 mm	$\frac{1}{10}$	1·00 mm
$\frac{1}{40}$	0·26 ,,	$\frac{1}{9}$	1·12 ,,
$\frac{1}{30}$	0·35 ,,	$\frac{1}{8}$	1·25 ,,
$\frac{1}{24}$	0·45 ,,	$\frac{1}{7}$	1·40 ,,
$\frac{1}{20}$	0·52 ,,	$\frac{1}{6}$	1·60 ,,
$\frac{1}{18}$	0·58 ,,	$\frac{1}{5}$	1·89 ,,
$\frac{1}{16}$	0·65 ,,	$\frac{1}{4}$	2·30 ,,
$\frac{1}{14}$	0·74 ,,	$\frac{1}{3}$	2·90 ,,
$\frac{1}{12}$	0·85 ,,	$\frac{1}{2}$	2·97 ,,
$\frac{1}{11}$	0·92 ,,		

How it is that hyperopia of $\frac{1}{12}$ in one person causes absolutely no trouble, in another person causes severe and constant asthenopia, while in a third it leads through convergent strabismus to the loss of practical vision in one eye, will be considered at length in our next.

The following questions and answers are appended to the article.

Question.—Will you kindly explain—*First.* Why a Hypermetrope of 1. D., aged 49, requires his reading glasses so strong as 3·5 D., to read Snellen D=0.50 at 13in? *Second.* With his H. and Pr. corrected what should be the smallest size of Snellen's test type he should be able to make out with an effort at 8in?

Answer.—The average person not having any h requires at least 1. D. for reading. Consequently the glass for this person should be at least 2. D. Any addition to this correction is due to some one of the following causes: *First.* The individual could have had more h than was demonstrated by the trial with lenses. *Second.* The individual may have abnormally reduced accommodation from any inability of the ciliary muscle or diseased condition of the lens. *Third.* Mild glaucoma simply makes the requirements for convex lenses higher than normal. *Fourth.* The fact that one has previously worn glasses stronger than necessary would also account for the trouble. No answer can be given to the second question, because the result is never the same in any two individuals.

Question.—Will Dr. Bucklin . . . . kindly give me some advice in the following case: Last February a girl, aged 15, called for glasses. For the previous nine months she had been wearing —1·12 s. given by her physician with unsatisfactory results, as she complained of pains in the eyes, both with and without her glasses. I detected mixed ast., and believing her eyes to be in a disturbed condition from having worn — sph., I gave her + 50 sph. and instructed her to report in two or three months. She now reports the + sph. better than the — sph. previously worn, but still complains of the old pains in her eyes. I made another examination as follows: $V = \frac{15}{50}$, and accepts + sph. up to 1·00 *D.* which gives $\frac{15}{30}$. The darkest ast. lines then appear at *R.* 105° and *L.* 90°. The addition of — 3·50 c. renders ast. lines all comparatively clear, and with the glasses as follows:

R. + 1·00 s. ◯ — 3·50 c. ax. 5°
L. + 1·00 s. ◯ — 3·50 c. ax. 165°

her corrected $V = \frac{15}{20}$ being the best obtainable, and not obtainable with weaker — cyls. The retinoscope test shows the shadow movement to be *with* in the vertical and *against* in the horizontal directions. *Questions—First.* Is not the — cyl. element stronger than is warranted by the result? *Second.* Is it permissible to diagnose mixed ast. by using a sph. and a cyl. as in this case? *Third.* At her age and with no previous disease, should she not be enabled to read $\frac{15}{15}$? *Fourth.* In this case would you advise giving her the above glasses? At *no time* during the trial did any line or lines appear darker than the ones mentioned above.

Answer.—The way you experimented is not the way to find out what you wish to know. When the error of refraction is very small in one meridian and very great in the other, you may after your method blunder into a practically satisfactory result. If the person has the defect which your experiments indicate, + cylinders would have given better results than + spheres. *Second.* Suspecting mixed astigmatism. You should determine in which meridian the greatest error exists and fully correct this meridian with a cylindrical lens. In the above case the first correction should be a — cylinder because this is the prominent error of refraction. Having obtained the best possible result with a — cylinder you should have crossed it with a + cylinder axis at right angles to the axis of the cylinder. Having obtained the best possible correction of both meridians, you should transpose into a "mixed cylinder," meaning a + sphere ◯ a — cylinder of greater strength. This is done according to the usual rule. *Third.* Irregular astigmatism frequently so complicates regular astigmatism that the acuteness of vision cannot be raised to the normal standard. *Fourth.* I would not give these glasses without making a careful test in the manner above directed. You may have blundered on to the truth because the + sphere required is so weak, but in higher degrees of refraction in both meridians, the method you used is open to serious objections because as much as you improve one meridian you make the other meridian worse to a corresponding degree.

The Deeds of Arrangement Act, 1887.

LANCASTER.

Arkinstall, Joseph, 3, Blackburn Road, Bolton, and Rushey Fold Lane. Halliwell, watchmaker and jeweller. Trustee, Richard Jackson, 9, Mawdsley Street, Bolton, accountant, and another. Unsecured Liabilities, £326 8s. 4d. Estimated Net Assets, £230. Deed of Composition dated June 19, 1890; filed June 20, 1890.

Creditors.		£	s.	d
Preston and Co.	Bolton	89	0	8
Roffit, J. A.	„	79	2	5
Crook, A.	Patricroft	42	10	0
Sharple and Green	Birmingham	41	18	0
Horton, Mr.	„	40	0	0
Skinner, Jno.	„	15	13	8

WARWICK, WORCESTER, AND STAFFS.

Dowler, W. and Sons, 94, Great Charles Street, Birmingham, button and naval and military ornament maker (Partners, Thomas William Dowler, 92, Trafalgar Road, Moseley, King's Norton, also trading at 94, Great Charles Street, aforesaid, as gilt and plated jewellery manufacturer on his own account, and Arthur Patrick Dowler, 73, Soho Hill, Handsworth, trading as). Trustee, Thomas Edwin Kimberley, 12, Cannon Street, Birmingham, C. A. Unsecured Liabilities, £5,374 6s. 1d. Estimated Net Assets, £1,830 3s. 2d. Creditors fully secured, £1,969 8s. 2d. Deed of Composition dated May 25, 1890; filed May 31, 1890.

Dowler, Thomas William (separate estate). Unsecured Liabilities, £568 10s. 9d. Estimated Net Assets, £100.

Creditors.		£	s.	d.
McCreary and Co.	Loudon	40	14	10
Robinson, A.	„	11	10	1
Rose and Stumbles	„	12	16	7
Smith, J., and Son	„	22	6	11
Speyer, Schwerdt, and Co.	„	35	19	3
Swift, T., and Co.	„	28	14	2
Carlyle, Thomas	Aston	209	2	8
Hayes, F. W., and Co.	Banbridge	66	9	7
Adams, R. T. and J.	Birmingham	15	0	4
Swann, J.	„	12	5	2
Winder, J. B.	„	105	11	9
Allen, Henry	„	165	4	6
Aston, J., and Co.	„	19	16	8
Banks, W., and Co.	„	46	14	10
Brooks, A. H., and Co.	„	13	5	1
Bullock, T., and Sons	„	12	18	4
Burgum, W.	„	13	16	6
Clarke and Co.	„	11	18	3
Cooper, W.	„	43	5	6
Elkington and Co.	„	15	16	9
Finlayson, Bousfield, and Co.	„	18	10	0
Forrester Bros.	„	27	8	11
Gibbs and Babbington	„	119	1	1
Green, W. F.	„	84	10	3
Hammond, Turner, and Co.	„	11	2	11
Harrison, J.	„	41	16	9
Haydon, T.	„	30	4	2
Heaton and Dugard	„	86	2	9
Hiall and Co.	„	13	6	0
Rackham and Matthews	„	39	5	0
Wiggin, H., and Co.	„	178	6	2
Corporation of Birmingham	„	19	18	3
Queen's Taxes	„	28	7	6
Poor Rates	„	13	1	4
Birmingham and Midland Bank	„	1,119	8	2
Dowler, William (Trustees of)	„	1,551	4	5
Dowler, Hannah	„	650	0	0
Knowles, Cooke, and Co.	Bradford	48	5	8
Dalton, Barton, and Co.	Coventry	20	12	6
Knox, W. and J.	Kilbirnie	11	12	0
Goodwin, S.	Leek	12	13	3
Hind and Band	„	12	7	7
Mulliner, J.	Manchester	15	6	0
Clark, W., and Son	„	19	14	3
Wilkinson, J., and Sons	Saltley	1,032	16	7
Swann, J.		111	11	2
White, —		871	5	0

Separate Estate of THOMAS WILLIAM DOWLER.

Curtis and Curtis	Birmingham	12	7	6
Cooper, T.	„	18	16	0
Clarke, Miss	„	11	17	1
Grearer, T.	„	21	0	0
Haydon, Thomas	„	33	14	4
Ireland, Robert	„	15	11	0
Kemp and Son	„	88	0	0
Lines and Son	„	18	18	2
Pearson, J. R.	„	16	7	0
Wood, H.	„ (abt.)	120	0	0
Collett, G.	Moseley	38	4	7
Farmer, E.	„	16	0	0
Hadley, Thomas	„	22	0	0
Kahn, —		16	12	0
Rent, Hydes, — (Exors. of)		48	15	0

DEVON.

Guillaume and Son (Guillaume Guillaume, trading as) 91, Queen Street, and 53, Blackboy Road, Exeter, watch and clock maker. Trustee, A. L. Honey, Post Office, Exeter, accountant. Unsecured Liabilities, £1,325 17s. 5d. Estimated Net Assets, £946 5s. 5d. Creditors fully secured, £10. Deed of Composition dated May 27, 1890; filed June 3, 1890.

Creditors.		£	s.	d.
Horwitz, D., and Co.	London	11	0	0
Marples, R. M.	„	18	0	0
Richards and Co.	„	28	0	0
Stauffer, Sons, and Co.	„	43	0	0
Summons and Fredericks	„	22	0	0
Tucker, W. E.	„	45	0	0
Huguenin, Hall, and Co.	„	15	0	0
Dimier, Bros., and Co.	„	156	0	0
Evans, W. H., and Sons	Birmingham	20	0	0
Simmons, S. B.	„	55	0	0
Player, J.	Coventry	23	0	0
Algar, —	Exeter	12	0	0
Brooking, J.	„	32	0	0
"Devon and Exeter Gazette"	„	21	0	0
Guardians of Syme's Infants	„	65	0	0
Havill and Sons	„	21	0	0
Latimer and Glanville	„	12	0	0
Milford, Snow, and Co.,	„	189	0	0
Guillaume, —	Paris	97	0	0
Westlake, —	Whitstone	305	0	0

YORKS.

Osbourne, Alam, 21, Mytongate, Hull, jeweller. Trustee, Frank Hall, Hull, Accountant. Unsecured Liabilities, £689 15s. 7d. Estimated Net Assets, £145. Deed of Composition dated May 31, 1890; filed June 7, 1890.

Creditors.		£	s.	d.
Mott, Thomas	Birmingham	150	0	0
Cohen, J., and Sons	„	60	0	0
Blanckensee and Co.	„	66	0	0
Little, James	London	48	19	0
Boyd, John	Manchester	40	0	0
Cooke, William	Birmingham	36	4	11
Troup, John	London	35	0	0
Arundel, Alma	Hull	35	0	0
Needham, F.	Birmingham	34	16	10
Cohen, Benno	Hull	32	7	9
Empringham, Thos.	„	30	0	0
Armstrong Bros.	Manchester	30	0	0
Redfearn, Wm.	Hull	20	0	0
Homer, A.	Birmingham	19	13	6
Briggs and Co.	Sheffield	12	9	0

Highley, Charles, and Highley, Samuel, both of 37, New Briggate, Leeds, jewellers and watchmakers. Trustee, George Graham Poppleton, Temple Row, Birmingham, C.A. Unsecured Liabilities, £431 1s. 3d. Estimated Net Assets, £250. Deed of Composition dated June 12, 1890; filed June 16, 1890.

Creditors.		£	s.	d.
Troup and Son	London	226	9	7
Bowman, R. T.	„	28	12	13
Greenwood and Son	„	22	0	3
Highley, A.	„	100	0	0

WARWICK.

Howell, Joseph, 39, Augusta Street, and Jenkins Street, Small Heath, Birmingham, jeweller. Trustee, J. W. B. Brown, 14, Temple Street, Birmingham, C.A. Unsecured Liabilities, £332 12s. 9d. Estimated Net Assets, £120. Composition of 2s. 6d. in the £, payable within 7 days of execution hereof, by all Creditors. Deed of Composition. dated June 12, 1890; filed June 17, 1890.

Creditors.		£	s.	d.
Ashford, —	Birmingham	17	0	2
Allen Bros.	„	11	2	1
Booth Bros.	„	16	9	11
Bowen and Son	„	17	11	6
Durban and Co.	„	13	2	11
Downing, A	„	12	0	3
Forrester, —	„	10	17	0
Howes, T.	„	17	10	0
Perks, M.	„	26	19	6
Page, E.	„	19	1	6
Price, J.	„	16	2	6
Wakefield Bros.	„	10	1	2
Yeomans	„	15	0	0
Bott, W.	„	51	5	0

WARWICK, MIDDLESEX, AND STAFFS.

Loveridge, S. and Sons, 112 and 113, Great Charles Street, Birmingham, and at 65, Hatton Garden, E.C., jewellers (Partners, William James Loveridge, 186, Hampstead Road, Handsworth, and George Loveridge, Hillside, Crouch Hill, Islington, trading as). Trustee, Allen Edwards, Birmingham, C.A. Unsecured Liabilities, £6,895 5s. 2d. Creditors fully secured, £1,500. Composition of 7s. 6d. in the £, payable by four equal instalments at 3, 6, 9, and 12 months from May 20, 1890. Secured. Deed of Composition dated June 16, 1890; filed June 21, 1890.

Creditors.		£	s.	d.
Allday, H. and Son	Birmingham	160	11	5
Ashford and Son	,,	71	2	3
Ashford, H. W. and Co.	,,	77	4	10
Adams, J.	,,	20	3	11
Adie and Lovekin	,,	160	12	11
Brandon Bros.	,,	62	16	1
Banks, J. M.	,,	320	18	10
Booth, E. F. and Sons	,,	256	14	3
Baker, E. and Sons	,,	45	16	1
Beesley, D.	,,	56	5	6
Broughton, C. D.	,,	67	7	11
Berger, A.	London	19	6	6
Cleverly, H.	Coventry	15	9	0
Carter, I. and Sons	Birmingham	35	1	1
Ehrhard, W.	,,	69	5	0
Emannel, L.	,,	23	15	8
Fridlander and Co.	Coventry	63	12	11
Freeman, J. and F. H.	Birmingham	189	0	5
Goode, J. and Sons	,,	288	0	6
Griffin, J. J. and Co.	,,	26	6	8
Gibbons, W.	,,	10	3	8
Hayes Bros.	,,	24	0	6
Hinde Bros.	,,	142	8	10
Hascler Bros.	,,	16	14	9
Johnstone, J. H. and Co.	,,	342	12	4
Lotheim, M. S.	,,	27	15	3
Loveridge, G. and Co.	,,	310	0	0
Marston, J. and H.	Coventry	119	13	10
Mason, J.	Birmingham	46	8	10
Minshull and Latimer	,,	30	11	4
Michael Bros.	London	96	19	0
Mayer and Fulda	,,	316	0	6
Nicholls Frevitt	Birmingham	95	13	0
Noodman, Jules	London	29	17	0
Oliver, W.	Birmingham	61	4	7
Phelps Bros.	,,	40	18	9
Patterson and Slater	,,	13	5	9
Parkes, S. and Sons	,,	12	0	3
Page, E.	,,	183	0	7
Proctor, W. E.	,,	195	3	8
Pendleton, W. and Sons	,,	18	3	1
Rolason Bros.	,,	71	3	9
Smith, V. C.	,,	13	18	0
Smith Bros.	,,	32	15	10
Schaeffer, F. and Co.	London	79	9	6
Smith and Ewen	Birmingham	44	7	0
Stokes, J. C.	,,	10	15	6
Tncker, J. and Co.	London	114	3	9
Vaughton, E.	Birmingham	267	15	8
Wrighton, C. M.	,,	69	10	9
Wakefield Bros.	,,	225	18	1
Wilkinson, W.	London	26	6	0
Woolnough, F.	,,	24	11	1
Birmingham District and Counties Bank	Birmingham	290	6	5
Hall, Mrs.	Handsworth	987	5	10
Stone, Mrs.	Birmingham	320	7	0

YORKS.

Baron, Jane, and Baron, Job Hold, both of the Old Curiosity Shop, 13, Sheffield Road, Barnsley, tobacconists, wholesale druggists, seedsmen, jewellers, clothes and general dealers. Trustee, James Harrison, George Yard, Barnsley, wholesale grocer, with a Committee of Inspection. Unsecured Liabilities, £1,590 16s. 9d. Estimated Net Assets, £355. Creditors fully secured, £200. Deed of Composition dated June 9, 1890; filed June 10, 1890.

Creditors.		£	s.	d.
Wakefield and Barnsley Union Bank, Limited	Barnsley	600	0	0
Baron, James	,,	200	0	0
Swift, John	Sheffield (about)	80	0	0
Berry, Mrs.	Balby	50	0	0
Player, John	Nottingham	54	0	0
Baron, Miss	Barnsley	45	0	0
Wood Bros.	Leeds	44	10	7
Kennedy, J. and E.	Dublin	43	15	11
Jackson, George and Co.	Whitehaven	38	15	0
Clarke, Bleasdale, and Co.	York	32	0	0
Harvey and Davy	Newcastle-on-Tyne	27	11	0
Gallagher and Co.	Belfast	26	8	0
Robinson and Sons	Stockport	23	0	0
Jones and Son	London	21	10	0
Pinder, R. and Co.	Nottingham	21	0	0
Trotter, Mrs.	London	20	0	0
Grace Bros.	Leeds	20	0	0
Willis and Roberts	Manchester	19	10	2
Wilson, W. C. and Co.	Sheffield	18	4	0
Colonial Clothing Company	Leeds	16	0	0
Murray and Co.	Belfast	15	8	10
Goodall, Backhouse, and Co.	Leeds	10	16	4
Ledgar, Richard (Trustees of)	Barnsley	60	0	0

Balle, William Bannon, late Arthur Place, Camden Street, Birmingham, now Avenue Lodge, Selly Oak, ring maker.

Creditors.		£	s.	d.
Shorthouse, B. and G.	Birmingham	72	0	0
Capital and Counties Bank	,,	36	0	0
Read, E.	,,	46	15	0
Fince, H.	,,	150	0	0
Ratcliffe, J. F.	Birmingham	12	0	0
Sheldon, W. H.	,,	15	0	0
Palmer, J.	,,	26	0	0
Townsend, F.	,,	10	0	0

Michael, Alfred, Cambrian Villa, Ashgrove Road, Redland; and 31, Wine Street, Bristol, pawnbroker and jeweller.

Creditors.		£	s.	d.
Eames and Co.	Birmingham	259	8	6
Michael, Maurice	Bristol	6,014	0	0
James, Harry, and Co.	,,	312	18	4
Platnaeur Bros.	,,	68	12	11
Arrowsmith, J. W.	,,	21	4	0
Wingfield, Rowbotham and Co.	Sheffield	392	8	10
Bolsover and Co.	,,	21	13	9

The bankrupt had not surrendered up to the date of the first meeting, at which proofs for the above amounts were tendered. He has not submitted any statement of his affairs, but the liabilities are estimated at £8,000, and assets £2,000 to £2,500.

Holman, Walter George, 47, Lower High Street, Wednesbury; late 158, Stapleton Road, Bristol, jeweller.

Creditors.		£	s.	d.
Conway and Co.	London	16	13	9
Cartwright and Sons	Birmingham	10	0	0
Wattis Bros.	,,	10	0	0
Owen Bros.	Bristol	106	0	0
Holman, Emma S.	Wednesbury			
Fully Secured Creditors		14	9	3
Preferential Creditors		19	13	8

BANKRUPTCY PROCEEDINGS.

Balle, William Bannon, late Arthur Place, Camden Street, Birmingham, and Avenue Lodge, Selly Oak, ring maker. Receiving Order: May 20.

Balle, William Bannon, late Arthur Place, Camden Street, Birmingham, and residing at his father's house, Avenue Lodge, Selly Oak, ring maker. First meeting: 25, Colmore Row, Birmingham, June 11, at 11. Examination: C.C., Birmingham, June 26, at 2. Adjudication: May 23.

Bradley, William Robert, 841 and 843, Attercliffe Road, 50, Attercliffe Common, and Worksop Road, all Sheffield, draper, jeweller, and furniture dealer. Receiving Order and Adjudication: June 10.

Ellison, Richard, trading as James Blakey, 212 and 214, Kirkstall Road, Leeds, pawnbroker and clothier. Receiving Order and Adjudication, May 19.

Ellison, Richard, trading as James Blakey, 212 and 214, Kirkstall Road, and 1 and 3, Thornton Street, Kirkstall Road, Leeds, pawnbroker and clothier. First meeting: Official Receiver's, Leeds, June 13, at 11. Examination: C.C., Leeds, July 1, at 11.

Fraine, John Nelson, 16, Regent Street, New Swindon, jeweller. Receiving Order and Adjudication: May 29.

Fraine, John Nelson, 16, Regent Street, New Swindon, jeweller. First meeting: Official Receiver's, Swindon, June 13, at 12. Examination, Corn Exchange, Swindon, June 18, at 2½.

Holman, Walter George, 47, Lower High Street, Wednesbury, late 158, Stapleton Road, Bristol, jeweller. Receiving Order: May 22. First meeting: Official Receiver's, Walsall, June 18, at 11¼. Examination: Court House, Walsall, June 18, at 12. Adjudication: May 23.

Hook, John James, Midsomer Norton, watchmaker and jeweller. Receiving Order: June 10. First meeting: Official Receiver's, Bristol, July 2, at 12½. Examination: Town Hall, Wells, June 18, at 12.

Kurman, Israel Moses, 365, Commercial Road, 106, Barking Road, and 52, Rye Lane, Peckham, watch jobber and jeweller. Receiving Order and Adjudication: May 31.

Kurman, Israel Moses, 365, Commercial Road, 106, Barking Road, and 52, Rye Lane, Peckham, watch jobber and jeweller. First meeting: 33, Carey Street, W.C., June 25, at 2½. Examination: 34, Lincoln's Inn Fields, July 11, at 11½.

Myers, Joseph, 14 (formerly known as 5), Duke Street, Aldgate, and 13, Salisbury Road, Dalston, wholesale optician and jeweller. Adjudication: May 28.

At the sitting of the Lewisham Court last month before Mr. Pitt Taylor, the Registrar:—

Mrs. E. SYBELLA MUDON, jeweller, of Kirkdale, Sydenham, was examined. She had liabilities amounting to £547 15s. 3d.; assets, *nil*, or rather estimated to produce £7, but swallowed up in preferential claims. On May 20, debtor was ordered to furnish cash accounts. This she failed to do, saying it was impossible for her to do it, since her husband kept no books whatever. Mr. Gibson reminded her that the business was in her name, to which she replied that she knew nothing about conducting the business and her husband did. One of the creditors said that her husband did keep a cash book, he had seen it, and it was kept correctly. The Registrar said the debtor had failed to comply with the orders of the Court, and she could not pass a public examination till she had done that. If the creditors wished to press matters, they knew what course to take.

Hook, John James, Midsomer Norton, watchmaker and jeweller. Adjudication: June 20.

Imperiali, William Giovanni, 102, Edgware Road, late 38, Dewhurst Road, Brook Green, W., jeweller's assistant. Receiving Order: June 20.

ADMINISTRATION ORDER.

Sherrington, Samuel, 137, Copenhagen Street, Barnsbury, working jeweller and confectioner. £48 1s. 11d. Eleven creditors. May 17. No. 498.

The
Watchmaker, Jeweller & Silversmith.

Edited by D. GLASGOW, Jun.

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CONTENTS.

PAGE
Editorial 25
General Notes 26
The Diamond Market 28
Sheffield Notes. From Our Correspondent 28
Some Optical Properties of Gems. By W. J. Lewis Abbott, F.G.S. 29
Edinburgh Exhibition—The French Section... 31
The Watch Trade... 32
Trial of Chronometers at the Greenwich Observatory 33
Trial of Deck Watches at the Greenwich Observatory 34
The Utility of the British Association... 35
On the Electro-Deposition of Platinum. By Dr. Wm. H. Wahl... 36
New Gem Company 39
Low Prices and Cut Profits 39
Carey *v.* Long's Hotel (Limited) 41
Meeting of Creditors 41
A Southport Bankruptcy Appeal 42
Bankruptcy of a Jeweller in Glasgow 42
A Famous French Jeweller 43
The Gordon-Orr Diamond 44
The Mineral Wealth of South Africa 44
The Mexican Pearl Fisheries 44
The Burmah Ruby Mines 45
Diamonds 46
The Metallurgical Arts at the Paris Exhibition 46
Applications for Letters Patent... 47
Recent American Patents 47
The Deeds of Arrangement Act, 1887 47

The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

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409, George Street, Sydney.

VICTOR KULLBERG.

In the death of Victor Kullberg, which occurred last month, after a short illness, English horology has sustained an irreparable loss. As a manufacturer of high-class work; as an inventor; as a competitor at the Greenwich and other trials; and last, but not least, as an exhibitor of watches and chronometers at the various International and local exhibitions, Victor Kullberg did more to demonstrate the live state of English horology during the time he was one of its exponents than any other half-dozen members of the trade in the same period. And, as a matter of course, he had his reward. He did not claim to do these things from motives of pure philanthropy. He was inundated with medals and honours from every country (we might almost say every town) in Europe, and several distinctions of the same character came from America.

Two inventions of his, which, as he did not patent them, he gave to the trade, were what are known as Kullberg's Balance and Kullberg's Improved Balance, both for marine chronometers—a third, which he didn't make the trade a present of, was "how to get first on the list at Greenwich;" this he had a singular facility of doing, it might almost be said, when he wished.

Mr. Kullberg was born in Visby, on the island of Gothland, in Sweden, and (after having served an apprenticeship with a local watchmaker, and afterwards worked for the celebrated L. U. Jürgensen in Copenhagen) came to this country in 1851. Here, at first he worked as a chronometer escapement maker to the trade, until (probably recognising the possibilities of the branch he since so ably made the most of) he started as a manufacturer. Of an extremely modest and retiring disposition, Mr. Kullberg was but little known personally to the bulk of the trade—although his name has been a synonym for excellence for many years—to those who enjoyed his acquaintance, however, he was very accessible, and in some of the haunts that now will know him no more, his loss will be deeply felt.

GENERAL NOTES

Referring to the recent hot weather in the States, the Omaha correspondent of a contemporary said that the tropical temperature this week roasted the life out of trade and left traders scarcely enough energy to work a fan.

Coral.—Corals are appearing in great variety in the Paris and London markets, and will, it is thought, be worn this season very generally; and those who have put them away in an odd corner of their jewel-case will bring them again into the light of day.

The trowel used by the Prince of Wales in laying the foundation stone of the new Royal College of Music at Kensington last month and which is made from the metal of the corrugated boiler flues of the troopship Prætoria, was mounted in gold by Messrs. James Dixon and Sons, of Sheffield and London.

The largest perfect diamond in the world is the Imperial, now in Paris. It is owned by a syndicate, which has offered it for sale at £200,000. It is cut, and weighs 180 carats, the greatest known weight of any cut stone in the world. It is exceptionable in colour and brilliancy.

We have before us the newly-issued catalogue of Messrs. Keat and Co. of 214, Goswell Road, E.C. It seems very complete as a watchmakers' and jewellers' supply catalogue, and the prices, which are plainly marked opposite to each item or article, compare favourably with factors' prices generally. The firm will be pleased to forward to the trade on application.

Messrs. Harburg and Co., 9, Holborn Circus, presented Mr. H. M. Stanley, on the occasion of his marriage, with a very valuable spirometer watch stated to be the first of its kind ever seen in England. The ingenuity of it is, that in a moment the comparative time of nearly all the chief cities of the world can be known exactly. It is double-faced, and its two dials look very pretty, each town given being of a different colour.

Mr. G. Carter, of 193*a*, Mare Street, Hackney, has introduced to the trade a preparation of bone in the form of a solid block for cleaning the brushes used in cleaning watches, and gilt and coloured-gold jewellery. From a short trial, we can say that it is quite equal in its cleansing properties to any of the chalk and other preparations we have seen, while it has the additional advantage of not scratching the gilding. Mr. Carter calls it "Boneca;" it is done up in cardboard boxes.

Messrs. J. C. Bechtler and Co., the well known Allahabad jewellers, purpose holding a grand raffle of some valuable jewellery on the Art Union principle at no distant date. There will be twenty prizes, varying from Rs. 350 to Rs. 20, and 2,000 chances at one rupee each. The proprietors of the firm have very generously consented to place 10 per cent of the proceeds towards the fund for the erection of the summer house for soldiers' children at Mussoorie.

We have received from Mr. John Tann, of 11, Newgate Street, E.C., his illustrated price-list, just issued, which is a very clear, illustrative, and descriptive account of what the firm are at present producing in the form of every kind of strong-box, burglar and fire-proof safe, grille, strong-room, etc. The catalogue proper is suitably supplemented by a sort of appendix giving details of the manner in which many of the firm's safes have passed triumphantly through the ordeals of burglaries and fires. Jewellers should apply for this list.

Some time ago we referred to the fact that Messrs. Flavell and Co., Coventry, had gone into the cycle manufacturing trade. They now send us their new illustrated price list containing particulars of the machines and accessories manufactured by them. The catalogue is well got up in every way, the descriptions and specifications especially being such as no one could mistake. Those shopkeepers who contemplate doing as we advised some time since and going in for stocking remunerative novelties cannot do better than write for a copy of the price list.

A Big Find of Gold and Silver.—A big find of minerals, including gold and silver, is reported from a logging creek near the belt of the high mountains near Butte, Montreal, says a Dalziel message. A man named Douglass is said to be the happy individual who has thus tumbled upon a fortune. Douglass was working in a hole sixty feet below the surface of the ground, when he struck a vein of gold, silver, and copper ore seven-and a-half feet thick. He uncovered nineteen feet of the vein, and the mass is said to average £520 to the ton.

Daring Burglary.—The shop of Mr. Litchfield, Hanway Street, was burglarised last month and property to the estimated value of £600. stolen, including jewellery, ivory and enamel goods, and antiques. The shop is locked up at nights, and a complicated arrangement of burglar alarms fitted to the doors and windows, but this did not deter the thieves, who must have planned the robbery for some time, and it would seem, also have known their ground. A reward is offered, and the affair is in the hands of the police, but judging from past experience, it is doubtful if anything come of it.

A New "Trust".—An Onyx Trust has been formed, with a capital of 1,500,000 dols., to control the production of all the mines and quarries in Mexico. The new company is to replace native labour, and develop the industry according to modern ideas, to which end it will run its own vessels between Vera Cruz, New York, Liverpool, Havre, and Hamburg. It will obviously take a large onyx crop to supply these ships with freight, and it is perhaps noteworthy in this connection, thinks the *Financial News*, that the gentleman who describes himself as the "Onyx Chief" dates from "Buncombe" County, North Carolina.

Theft from Messrs. Benson.—Albert Arthur Cheshire, 17, of 70, Royal Road, Kennington Park, was charged last month with stealing eight gold and silver watches, the property of Messrs. Benson, jewellers and watch manufacturers, Ludgate Hill.—The prisoner was a junior clerk in the employ of the prosecutors, and nine watches were missed by Mr. Poulter. They belonged to customers. Afterwards the prisoner voluntarily went to Mr. Poulter and asked that he might have an interview with the chief manager. He then admitted to that gentleman that he had stolen the watches, and he gave up the pledge tickets.—The alderman remanded the prisoner for inquiries.

The Melbourne "Union."—An endeavour is being made to resuscitate the Jewellers' and Watchmakers' Union, which died out about three years ago, owing to various causes. The old rules are being adopted, and the chief thing provided for by these is the eight hours system. Although this system has for a long time past been observed in the principal shops in the trade, the work of the society will be to enforce it in those shops which at present do not practise this system. Another work of the society will be to take a stand with regard to the amount of "improver" labour which, it is alleged, exists in the trade to a considerable extent.

The New Prussian Crowns.—Although it has been the custom in Germany for generations that the sceptre, sword and shield should be inherited, up to the present time the kingdom has lacked a crown of a definite and lasting design. It is in consequence of this that the present Emperor, William II., has given orders for a new crown to be prepared for himself and a diadem for the Empress. It was originally intended that the new crown should be the same in design as the first Prussian crown, but it has been found necessary, owing to the shape and largeness of the stones, to make slight alterations in the details of the setting. A clever, twisted gold-leaf work serves as a mounting for the large diamonds with which the whole of the broad frontal of the crown is bordered. From this rise eight diamond hoops, each set with four diamonds in the shape of a rosette, which is again surmounted by a brilliant diamond cross. The design selected for the diadem of the Empress, while, perhaps, of not quite so regal an aspect as the Emperor's crown, is, nevertheless, a magnificent specimen of jewellery, the diadem being one fiery and sparkling mass of brilliants. A large wreath set with diamonds, from which are suspended some magnificent pearls, forms an effective set-off to the base of the diadem.

Recovery of Jewellery near Warrington.—A case of burglary now in the hands of the Liverpool police is remarkable for a singular recovery of a large amount of stolen watches and jewellery. Between Saturday night and Sunday morning, July 5 and 6, thieves entered the pawnbroker's shop of Mr. Newport, at the corner of Benledi Street and Scotland Road, and jewellery and watches were stolen to the value of £100. The matter was placed in the hands of Detectives Baxter and Holmes, who on Wednesday arrested, in a cocoa-house in St. Anne Street, two youths who are stated to have had at the time some of the stolen property in their possession. By far the greater part of it, however, could not be found, but from information given by one of the prisoners, the detectives learned that a large amount of the valuables would be found in a pit on the Liverpool Road, near Warrington. The officers proceeded to the place, accompanied by the prisoner who had given the clue. With the assistance of some of the Warrington and county police the pit was drained; and after searching for some time in the mud at the bottom, the plunder was found. It consisted of three gold and ten silver watches, and several gold albert chains, wrapped in a silk handkerchief. The handkerchief had also been stolen from Mr. Newport's shop. While the operations were in progress, a rumour became current in the neighbourhood that the police were searching for bodies, and that a shocking tragedy was about to be unearthed. Attracted by morbid curiosity, a large crowd assembled, but their expectations were not fulfilled.

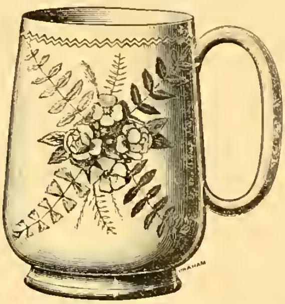
A Prize Clock.—A curious action, which will be of interest to friend chronometer maker Isaac and his brother anglers, was heard in the Manchester County Court recently. The Salford Friendly Anglers' Society sued a former president, Mr. Joseph Jeffs, for the recovery of a prize clock, of which they alleged he had wrongfully obtained possession. The society, which was established in 1815, holds an annual fishing competition, and the man who catches the heaviest fish takes his choice of the prizes, of which some are paid for out of the funds of the society, and the others given by friends. The defendant was the fortunate angler at the last competition, and accordingly chose the clock, which was handed over to him. One of the rules of the society was that no member should belong to any similar club; but it subsequently transpired that the defendant's name was on the books of a second society, and that he had won another prize in a competition promoted by them. The Salford Society thereupon asked for its clock back again, but the defendant refused to give it up. The defence was that the defendant had been made a member of the second society without his knowledge. His Honour, Judge Heywood, said he did not think that the action was maintainable. The defendant, having won the clock, might keep it; the fact that he had won it contrary to the rules might entitle the society to something in the shape of damages but they could not get the clock back. In reply to the plantiffs' solicitor, his Honour pointed out that the society was unregistered, and it was not intended that the law should interfere with societies of that sort. Judgment was given for the defendant, with costs.

New and Valuable Auxiliaries for the Trade.—The New York *Jewelers' Weekly* in recommending retailers to add to the goods they handle, in the above named direction, says that for several years the principal retailers of the larger cities have profitably handled art pottery, bisques, bronzes and cut glass. Last fall the *Weekly* recommended such goods to the trade everywhere, and it is gratifying to be informed by its advertisers that their sales of these kinds of goods to retail jewelers in 1889 were unusually heavy. Retailers appear to have generally awakened to the fact that these lines are valuable auxiliaries to their stocks of jewelry, silverware, watches and clocks, and their experiences during the holiday season of 1889 are such as to encourage them to continue and perhaps to enlarge these departments. There is another important consideration connected with this branch of the trade. January, February, March, April and May, particularly the last mentioned three, are the dullest months in the year for the retailer who handles only regular lines. Art pottery, bronzes, cut glass, and even bisques, are peculiarly adapted to this season of removal, renovation and household decoration. It is the season when good housewives set their homes in order and beautify them, and in every community where there is good taste and refinement there will be a more or less brisk demand for articles of vertu of artistic design, if they have been selected by the retailer with a proper regard for the means of his customers. The retailer who intelligently experiments in this direction will be surprised at the volume of business he will transact during what less enterprising merchants regard as the dullest season of the year.

Failure of a Birmingham Jeweller.—A meeting of the creditors of Richard Perkin Davis, jeweller and silversmith, carrying on business at 169½, Hockley Hill, was held at the office of the Official Receiver, Colmore Row, on the 22nd ult. The liabilities amount to £400 9s. 10d., and the assets are estimated to produce £13 6s. 4d., a deficiency thus being left of £387 3s. 6d. The bankrupt commenced business about 1879, at Tenby Street, Birmingham, in partnership with a Mr. White, as jewellers and silversmiths, under the style of "R. P. Davis and Co." Their capital, amounting to £250, was found by Mr. White. The result of the first year's trading being a loss, Mr. White decided to leave his capital in the concern at 5 per cent. interest, but not to take any part in the business. After this the debtor traded in his own name. In 1880 he gave Mrs. White, at her husband's request, a promissory note for the £250 referred to. His explanation for doing so is that a claim could then be made against his estate in the event of bankruptcy. Mr. White died in 1886, and no demand was made for payment of the £250 until Christmas last, when a writ was issued for the amount. The bankrupt defended it on several grounds, one of them being that it was a partnership debt. The liability now amounting to £360 5s., is entered in the statement, but it is still disputed. He was ordered to pay the money into Court, and being unable to do so, filed his petition. During 1883 and 1884, the bankrupt made several bad debts, and in the latter year became aware that he was insolvent. The failure is attributed to bad debts and bad trade. The case was a summary one, and the Official Receiver was appointed trustee.

In the Sale Rooms.—Two big sales of silver plate took place last month—one at Christie's and the other at Foster's—with regard to which the *Pall Mall Gazette* had the following paragraphs:—"Christie's to-day has an old-world perfume about the place that one rarely comes across except in the innermost sacristy of the cathedral of some Spanish or Italian city or decaying Normandy or Brittany town. The church work is lovely. Silver cups which might have been designed by Albert Dürer for the support of the soul of the Church or to feast the eyes of the great Maximilian, or have been designed by that artistic inventor in metal, Benvenuto Cellini. Besides the cups—chalices for the altar—set with gems, there are monstrances of Gothic design, reliquaries and crosses in rock crystal set in gold and silver, and finely engraved; pieces of embroidery in gold, curious old wood carvings of sacred subjects, beautiful ivories, some specimens of Limoges, quaint in colour, and a few marbles. The pictures by the early Italian and Flemish masters are also interesting."—"Those who hunt after old silver will look with jealous eyes at Foster's this week. The silver that they are selling amounts to upwards of 16,000 ozs., and consisting as it does of the stock of the late well-known Piccadilly silversmith, Mr. Wells, contains legitimate pieces. There is Indian, French, English, and Irish work among them in the way of tankards, ewers, castors, candlesticks, spoons, and dishes. A little of it dates back as far as James I.'s time, and while there is a catholicity about the entire collection as to date, there is a good sprinkling of pieces of last century manufacture—though in the question of weight the sale is outdone by the late Marquis of Normanby's collection, which is sold to-morrow at Christie's."

It's an ill wind that blows nobody any good, and if the abolition of the plate duties was a sort of robbing Peter to pay Paul, Paul won't grumble, at all events. Joking apart, though, however much the measure may damage the electro-plate trade (although it is only surmise up to the present that it will damage it at all), the trade will be amply compensated by the increase in orders for silver plate. Some firms, indeed, are already experiencing this increased demand, and having occasion to visit the premises of Messrs. R. Pringle and Co., of Clerkenwell Road, E.C., we had a practical means of judging what an increase all round in this direction would mean. On the occasion of our visit the firm were very busy making small Hall-marked silver articles, such as cups, children's mugs, serviette suspenders, small spoons, etc.; and as they make everything throughout from the rough, even to refining and assaying the metals used, one may judge of the effect of any large and sudden influx of trade, notwithstanding a very large staff of workers. Wilderness Works is now, in fact, becoming recognised in the trade as a kind of refuge for the destitute in the way of getting difficult jobs done which cannot be done elsewhere, and Messrs. Pringle have the reputation of being able to make everything in metal work from a silver brooch to a warming pan that can be manufactured in London, Birmingham, or Sheffield. They, at all events, are not afraid of the change likely to be, or already brought about by the abolition of plate duties, and are quite prepared, if necessary, to give up the electro-plate altogether, in favour of the solid ware.



The Diamond Market.

The only news that comes from *Amsterdam* is that cleavages are in demand. None but little stones are selling, and the market remains practically the same as it was at the time our last report was written.

The *Paris* market is very quiet, hardly any but foreigners are buying, and there is no local speculation whatever.

Considerable business was transacted in *London* during the month, large parcels coming from the Cape at the reduced prices now ruling—some 15 per cent. lower than has been the order of the day for some months previously. Should the present quotations continue, there is no doubt that a large increase of business will be chronicled in the near future and that many of those merchants who have been driven out of the market temporarily will be tempted to return to the alluring art of getting the better of one's fellows in business.

SHEFFIELD NOTES

From Our Correspondent.

Another attempt, ending in failure, has been made to sell the "Surplus Lands." For the majority of the lots not a single bid was made. The wisdom of the Improvement Committee in their method of dealing with these lands, is at last beginning to be called in question. With trade in its present state, it is felt that the howling wilderness in the centre of the town ought not to exist much longer. For the lot upon which Sangers' Circus stands, £12,500 was bid, and the opinion is pretty general that it ought to have been accepted. It is true this is not the price that would do for the centre of Manchester, but then Sheffield is not Manchester. The value of a thing is the price it will bring in the market, and these lands have been vacant sufficiently long to prove that the value the Improvement Committee put upon them is too high.

In the meantime the principal silver and electro-plate firms are still extending their borders. Some time ago I mentioned a report that Mappin and Webb contemplated extensive additions to their premises. The matter is now placed beyond question. A long range of frontage in Norfolk Street presents the forlorn aspect of empty tenements upon which a board proclaims the names of the architect and contractor who are going to erect additional buildings for the firm in question. Demolitions are also in progress in Eyre Street adjoining the works of Messrs. Walker and Hall, who only a short time since absorbed a considerable amount of land in the direction of Norfolk Street. It is probable, too, that the works of Mappin Bros., recently acquired by the London Goldsmiths' Company, will be very much enlarged when the leases of the adjoining properties fall in—an event of the near future.

All this points to a considerable amount of vitality on the part of the manufacturing silversmiths of Sheffield. Some of them have energy enough and to spare. I mentioned last month Mr. Sibray's crusade against overhead telephone wires and the battle royal which he was waging against the National Telephone Company at Dore. The fight still goes merrily on, the advantage so far being on the side of Mr. Sibray. Another silversmith who has a sacred mission outside his own business sphere is Lieut.-Colonel Bingham, of the firm of Walker and Hall. Mr. Bingham's ruling idea is that the whole fiscal policy of the country is out of joint. He accepts the principle of free trade with a difference. The difference comes in when a foreign country unduly taxes English and especially Sheffield manufactures. It is not to be wondered at, therefore, if Mr. Bingham saw a grand opportunity for airing his notions in the projected town's meeting to protest against the M'Kinley Tariff Bill.

The meeting itself was a magnificent success. For once in its history Paradise Square saw men of all shades of political opinion meet upon a common platform. The resolutions condemnatory of the measure were carried unanimously in a meeting which was thoroughly representative of all sections of the community. To begin with, it was a town's meeting presided over by the Mayor. The Master Cutler and the President of the Chamber of Commerce respectively moved and seconded resolutions which were supported by representatives of the Sheffield Trades Council. The Members of Parliament for the borough were expressly asked to stay away, in order to avoid giving an appearance of party politics to the proceedings. The word "retaliation" was certainly spoken by Mr. Bingham, who was however, promptly called to order by the Chairman.

"Pot Square" before now has struck the keynote of Imperial policy. I am much mistaken if it be not found so in this case. As a matter of expediency the word "retaliation" was tabooed at the meeting, but retaliation is meant, for all that. There is even a danger that something more than mere fiscal retaliation may be the ultimate development of the situation. The immense interests involved in the maintenance of trading relations between this country and America have had more to do with keeping the peace than any matter of sentiment. But if this Tariff Bill passes, there will be no trading relations to interfere with. How this will affect the course of events, when such questions as the Behring Sea controversy enters an acute stage, remains to be seen.

The matters in dispute between Messrs. Hutton and Sons and their workmen of the hollow-ware department still remain unadjusted. The men, backed by the Stampers' Union, still maintain an attitude of hostility to the new price list. It is a remarkable fact that, although this union has been in existence for about forty years, this is the first affair partaking of the character either of a strike or a lock-out in which they have been involved.

In the meantime the silver trade generally is in the enviable position of having nothing to grumble at. The universal testimony of manufacturers is to the effect that trade is better than it usually is at this time of the year. Moreover, the time is gradually drawing nearer when, as a matter of course, we expect preparations for the Christmas trade to commence. Fairly prosperous in the present, and hopeful as to the future, both masters and men are, with a good conscience, getting as much out of such summer weather as we are having as their respective means will permit. The manufacturing big pot goes off with his family to Bridlington or Scarborough, the young artisan to his camp of exercise, and the old fogy from the workshop to the Isle of Man, where he has gone regularly for the last forty years. In addition to this there is the annual outing which each factory has to the dales of Derbyshire, to which they start in the morning a smiling band in a long string of conveyances extending nearly half the length of Sheffield Moor, and whence they return in the evening a merry crew covered with the white dust of the limestone roads.

Death has just removed a somewhat remarkable figure from Sheffield public life. Mr. John Wilson, J.P., can scarcely be said to have risen from the ranks, as in a sense he remained in the ranks all his life. John Wilson (for colloquially the prefix "Mr." was rarely applied to his name) was a grinder, and worked at his trade until he retired on the modest competence which grinders were at one time able to realise. What education he possessed he obtained at a night school called the People's College, to which not a few Sheffield public men of a past generation owe a debt of gratitude. Mr. Wilson was elected a member of the town council by an East End constituency, and also ultimately became a member of the school board. He was certainly not a typical working-man's advocate, but he looked at a number of public questions from a working-man's point of view and in that way did a great amount of very useful work. On the attendance committee of the school board, for example, some of the applicants for a remission of school fees had a bad quarter of an hour at his hands, his experience of his own order enabling him to discriminate between the deserving poor and the habitual spongers. Although a justice of the peace at the time of his death, he had the misfortune some years ago to horsewhip an editor, the consequences of which rash act followed him to the last, as he was never afterwards reported.

A Magnificent Diamond.—The Nizam of Hyderabad recently bought in Madras a magnificent diamond for 165,000 rupees, which is known as the Gordon-Orr diamond. The stone weighed before cutting 67½ carats, and after cutting 24¼ carats. It is described as being the best, purest, and most brilliant stone known to connoisseurs, and will be worn by His Highness in his puggaree, or crown.

Some Optical Properties of Gems.

By W. J. Lewis Abbott, F.G.S.

I AM frequently asked by scientific men and the trade if there are no papers upon, or rough and ready methods to distinguish gems, the colour suites of which overlap. The fact is, their chief characteristics being their optical properties they are left by the mineralogist to the physicist, and by the physicist to the mineralogist or trader, and by the trader they are contemptuously relegated to the cracked-brained scientist, and so between all stools they fall to the ground. Of course, there are many more properties which distinguish gems from each other, but those of which I purpose to speak in this paper are some of the optical ones, and those chiefly relating to mono- and dichroism, and others which give rise to the lovely cat's-eyes, sun, moon, and star stones, and opals, and other peculiarities of certain gems, leaving other phenomena till a future occasion.

But, first of all, it is necessary to say something of colour and its origin, the more so because our common language is often at absolute variance with actual fact; *e.g.*, I have here a *ruby*; you say, What a lovely *red*! It is not *red* at all, it is *green*. I have here a lovely crystal of *emerald*; you say, What a charming *green!* It is not *green* at all, *it is red*. The poets, too, lend aid to these wrong conceptions, as "when he first saw light"—he never saw *light*—light is invisible. Obviously, then, by light and colour may be meant two very different things; it may mean the impression made upon the consciousness by certain phenomena, or it may mean the physical agent which originates that impression; it is with the latter that we are now concerned. This agent is that at once interstellar interatomic medium which we call ether, to which we postulate mechanical properties, which we treat upon mechanical principles, and in doing so are enabled to explain all the phenomena of light and colour.

We therefore regard light as the result of vibrations of this ether, in every direction across the line that it is travelling, which (latter) is always straight so long as its course is maintained through a medium of uniform density. That different media offer greater or less resistance or retardation to its progress, which sometimes results in a simple bending of the ray, in others to deflection in another direction, in a third to the alteration of colour and properties, and in a fourth to total extinction.

Let us now examine some of these phenomena more closely.

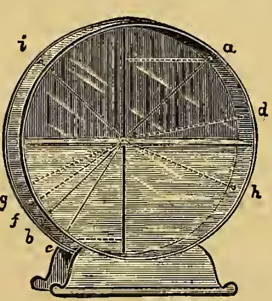


FIG. 1.

We have here a glass-fronted drum with a semi-transparent rim; through an aperture in the side (*a*) I reflect a pencil of light, it passes through the drum and makes a white spot on the opposite side (*b*). We do not see the light travel across the drum, for as we just said it is invisible. Upon puffing a puff of tobacco smoke into the drum we immediately see the passage of the light through it. I now fill it half-full of water and send the ray through again; it no longer travels in a straight line, but is deflected or refracted towards a line drawn at right angles to the surface of the water, leaving the water at *c*. If we draw a perpendicular from the vertical to *a* and another from the vertical to *c* and divide the former by the latter we get a certain number; this number is known as the *index of refraction.* For glass it is 1·5; ruby, 1·779; garnet, 1·815; zircon, 1·96; diamond, 2·45 to 2·75. We thus obtain the first law that *when a ray of light passes from a rarer to a denser medium it is bent back, or refracted, towards a line drawn perpendicularly to the surface of the medium.* The converse is also the case, which may be shown by the following experiment, and which will also explain why it is so.

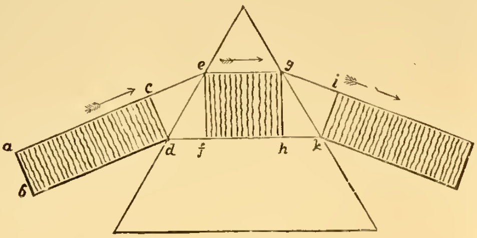


FIG. 2.

Before you is a section of a glass prism; imagine a ray of monochroic light to be represented by *a*, *b*, *c*, and *d*, vibrating at right angles to the line of propagation represented by the cross lines. As soon as the point *d* reaches the glass prism a greater retardation is encountered than that offered by the air to the upper part of the ray at *c*, so that the end *d* will move only through two-thirds of the distance through which the upper part will move; and by the time the point *e* enters the glass it will have just caught up to the point *f*, owing to the swinging-round motion that it underwent. Perpendicularly faced in a homogeneous medium it is again able to travel in a straight line, which it does till the point *g* reaches the edge of the prism, when the opposite conditions are encountered; for here it is leaving the denser medium and passing into a rarer one, or one in which it can move more freely, or over half again as great a distance in the same time. Consequently, by the time the point *k* has travelled to the edge of the prism, the upper part has reached *i*, with the effect of swinging the beam round again, and it once more is free to travel at right angles to this face.

If we lay the prism (about 1¼ inches wide) on the top of this book (6 inches wide) in its centre, and lay a shilling near the edge of the book, we fail to see the shilling by looking through the prism at it, but by placing the eye at the opposite edge of the book and looking up towards the apex of the prism we then see the shilling. If we carefully measure these angles we should find it corroborate the explanation given.

It thus accounts for the phenomena of defraction. *Practically*, the more dense the substance the greater the defraction. This shows us another great law, viz., *that the two elements of rapidity of propagation of light in any substance are elasticity and density.* It also shows that if the incident ray be perpendicular to the reflecting surface the light will be transmitted through, and leave it according to the shape of the sides of the gems, subject, of course, to other laws, such as those of reflection, as in no instance is light wholly transmitted, some, at least, being reflected back. If the ray be quite perpendicular, water will reflect back 1·8 per cent., glass 2·5 per cent., mercury 66·6 per cent.: and as obliquity increases reflection is augmented very quickly up to 89·2° when for water 72 per cent. is reflected; but at no degree of obliquity, even for a diamond, is reflection *total.*

Total reflection, however, may occur as follows: but first let us call to our minds the principle of reversibility, which is the converse of the laws just described of defraction from a rarer to a denser medium, *e.g.*, imagine a ray (*d*) striking the water, it would emerge at *f*, and, conversely, if we sent the ray in at *f* it would emerge at *d*; but if we moved it further from the perpendicular it might not leave the water at all, but would graze along the under surface. The angle which marks the limit beyond which total reflection takes place is called the limiting angle; it diminishes as the refractive index increases, for water it is 48½°, glass 38°41′, diamond 23°42′; thus all the light incident from two complete quadrants, or the whole of the surface of a diamond when set, is condensed into the angular space of twice 23°42′. If we move the ray further and cause it to enter at a greater angle, say *g*, it will be reflected back again to the other side of the drum, without leaving the surface of the water at all, obeying the same laws of reflection under water as above water, next to be described.

When our original ray impinged upon the water it was not all transmitted through; part was reflected back to the other side of the drum, leaving it at *i*. The ray which strikes the water is the *incident ray*; the ray which is reflected is the reflected ray; and it is another law that the angles which these two make with the perpendicular are always equal to each other.

When a ray of light impinges upon a gem part of it is absorbed by the gem itself, part is refracted to the back part of the stone, which, if the cutting be correct, is again reflected back to the eye, and part is reflected. But this treatment so alters the composition and appearance of light as to render it necessary to understand something of the nature of white light. Allowing a ray of *white* light to pass through a glass prism we find that on emerging it is no longer white, but drawn out a number of times its original length arranged in seven bands of colour passing insensibly into each other in the order of violet, indigo, blue, green, yellow, orange, red. Experiment shows these to possess different degrees of refrangibility: that the undulations of ether that produce them are of different lengths; and that the rate at which they move is also different. I will not burden you with any of these figures, going as they do into ten-millionths of inches, and hundredths of millionths of millionths of seconds. This coloured figure Newton called a *spectrum*, and the drawing-out of white light to its constituent colours *dispersion.* We thus see white light to be composite. If we were to separate the whole of these divided rays into two and then again blend them, they would again form white light. If, *e.g.*, I cut off the more refrangible rays up to a certain point we get red. If I cut off the less refrangible rays we get green, or I may make one part yellow, the other part blue. I must ask you to pay strict attention to the phenomena of complementary colours, as I shall have to employ them largely on a future occasion. It is to this splitting up of white light that we owe all the phenomena of colour; without it the present walls of the National Gallery would be plainer than the face of a chalk quarry seen in the distance, or as objectless as a London landscape in a November fog! And yet we cannot attribute everything to it, for there must be at least some ultimate relation between it and the atoms of objects, to enable them to perform their selective action—for selective it is, and not creative as the older theories postulated; they do not generate colours. When a ray of white light falls upon them they appropriate or absorb certain of the rays, neglecting or reflecting the others, which are sent back to our eyes. This is the solution of that volley of paradoxes with which I introduced you to this subject, for the fact is, it is that part of the ray which they *reflect* that comes back to our eye, and not that which they *absorb.* In the case of the blue sapphire it is obvious that as yellow and blue together constitute white light, and that if the part transmitted to our eye be blue the part left behind is yellow.

As early as 1792, Wünch had pointed out that there were three primary colours, and by an arrangement of prisms he was able to show the nature of each colour in the spectrum. Commencing at the red, finding it incapable of further decomposition he regarded it as a primary colour; orange, a mixture of red and weak green; yellow, a mixture of intense red and intense green; green, a primary; blue, saturated green and saturated violet; indigo, saturated violet and weak green; violet, primary. Subsequent research has shown him right in the main, although his theories were faulty.

But at this point I must introduce you to where our mother Nature first introduces herself to us arrayed in the attributes of the designer. I should have liked to have placed before you some experiments in magnetism to have reminded you of polar action—how that like poles repel and unlike attract, and that by virtue of this polarity steel filings may be made to assume forms of extreme beauty and symmetry—to assist you in picturing a force which brought together those component molecules into their present exquisite forms we call crystals. In virtue of this force, or forces, atom lays itself to atom in a definite and unerring manner, and at the end, perhaps of untold ages, the crystal is produced, whose planes are the result of this play of its molecules; each aggregation of molecules ending in a shape peculiar to the individual stone, whether it be ruby, spinel, chrysoberyl, or anything else.

Let us admire for a moment this unparalleled symmetry of this member of the isometric system—an octahedron of diamond or a skeleton model of a cube. How easy it is to imagine such a crystal built up with an all-sided molecular symmetry; and this implies a similar condition of the inter-molecular ether; therefore a ray sent through it in any direction would find the same degree of elasticity and density, and would therefore pass quite straight through. But let us take this beautiful crystal of emerald, or even the more plain-sided Iceland spar—we could not predict any such symmetry! and experiment shows that only in crystals belonging to the isometric system and uncrystallized matter does this molecular symmetry exist, but that it exists only along certain planes called the *optic axes*, and that along any other direction through the crystal different degrees of elasticity are encountered, so that while part of a transmitted ray is refracted straight through the apparently homogeneous spar at a certain angle, the other part suffers a different degree of refraction, so that the single light emerges double! this is called *double refraction.* Let us take the case of water; now there is nothing in the grouping of its molecules to destroy the ethereal homogeneity, but if we crystallize that water we find a different elasticity at right angles to the surface to that which is parallel to it, consequently it becomes doubly refractive. Newton tried to associate this two-sidedness of light with the two-endedness of magnetic polarity, and hence it came to be called—I might rather say miscalled—polarized light. And this brings me to the last phenomena with which I will burden you, before showing their practical utility in the discrimination of gems. As we shall presently speak of the tourmaline, I cannot do better, perhaps, than say a word or two upon *tourmaline plates.* I hold in my hand two plates of tourmaline cut parallel to the axis. They are both transparent, either singularly or longitudinally superimposed. I now cross them and they immediately become opaque! How is this? The shortest way to describe it is to consider that the grouping of the molecules is like a delicate piece of asbestos with the fibres all running lengthwise, only so far apart as to give free mobility to the ether, to allow of the transmission of light; but it is evident that when we remember the vibrations of ether are executed in all directions at right angles to the line of propagation, that that part of the ray which emerges will have all its vibrations reduced to a single plane, *i.e.*, it will be *plane polarized light.* We are now in a position to understand the darkness that ensued upon crossing the tourmalines, for when so placed all rays were quenched.

I might, however, say that neither Iceland spar or tourmaline is necessary to confer upon light this two-sidedness; it can be polarized by reflection from the polished surface of glass or any gem, and, indeed, always is so. There is just one more law that I must ask you to follow, *i.e.*, when polarized light falls at a certain angle (which of course differs for different gems, increasing *with* the refractive indices) the whole of the light is polarised. This is called the *polarizing angle.* For water it is 52½°, diamond 68°. It has always this remarkable peculiarity, that after leaving the reflecting surface it refuses to be further reflected, when the second surface stands at right angles to the first, but becomes immediately quenched.

Now as we employ this polarized light for all micro-petrological observations, recourse to which we may have on a future occasion, I may perhaps be allowed to say a word upon the instrument with which we obtain it—I mean the Nicol-prisms. A crystal of Iceland spar is cut along its shorter diagonal, polished and recemented with Canada balsam. A ray of light upon entering it bifurcates; on reaching the angulated surface the *ordinary* ray can escape, because the obliquity of the surface and elasticity of the interposing medium allows of it. But we noticed at the commencement that when a ray seeks to escape from a more refractive to a less refracting medium *total reflection* always takes place, providing the obliquity is sufficient, therefore meeting the Canada balsam, the refractive index of which lies between that of the two rays, one is totally reflected away, the other allowed to pass on, emerging from the crystal in a polarized condition.

Let us now see what use we can make of all this in the discrimination of gems. First we noticed the rectilinear propagation of light. If I wanted a ray to be reflected from the facet of a gem I should not get the light at its side (unless I turned the stone at a corresponding angle) but behind it! Next thing, I should remember that *the ray of incidence equals the ray of reflection*, and should therefore place the stone in such a position that the angle at which the light fell upon it was equal to that from the eye to the stone with a perpendicular to its surface. This is very important in showing a stone to a second person; remember that standing at a different angle if *you* see the beauties of the stone *they* do not.

Let us first examine a gem by reflected light. We have previously observed that when a pencil of light impinges upon a gem, part is absorbed by the gem itself, and gives to it a generalised colour; part is reflected back, suffering—or enjoying—more or less dispersion, and part is transmitted through subject to the laws of refraction, etc.

First, *reflection.* The intensity of reflection varies with different gems even when the degree of polish and the angle of incidence are as near as possible. To express the various degrees of lustre in gems we at present employ the mineralogical terms: *adamantine* as in diamonds; *resinous* as in jargoons, spinels, and garnets; vitreous as in emerald; *waxy* as in turquoise; *pearly* as in moonstone; *silky* as in crocidolite. But it must be remembered that the stages pass insensibly into each other, some stones lying in debatable ground, such as a fine ruby, which lies between the adamantine and resinous. Before me is a row of white stones; to the unobserving they are the same. If, however, we look at their surface lustre how very different it is! how glorious it stands out in the diamond, although competed for very keenly by the phenacites and jargoons which follow it. The white sapphires following have a special lustre, followed by the extremely rare gem the white spinel, and white topazes, while lagging behind comes a white beryl, and still a long way behind comes a variety of quartz.

The same may be said of the coloured stones, the surface lustre of which varies infinitely more. Take for instance these three stones of approximately the same colour: the uwarrowite, the peridot, and a pistachio green sapphire. What an oily appearance has the reflection of the peridot compared with the other two! In the uwarrowite its superior dispersion might make it appear to exceed the sapphire, although in reality it does not.

(To be continued.)

Edinburgh Exhibition.

THE FRENCH SECTION.

THE French exhibitors are a somewhat numerous body, and require for their housing two of the Eastern Courts. They are mainly Parisian, and their exhibits fall in a large measure under two or three well-defined classes. Of jewellery there are some half-dozen exhibitors, who make but a disappointing show. There is no variety, and practically nothing that possesses any outstanding merit of design or workmanship. At every stand the visitor is asked to inspect the same collection of trinkets—brooches, chains, and bracelets of stamped metal, enamel work, or filigree work in silver, oxidised silver, or silver gilt. A good deal of it is elegant and attractive, but there is an unvarying monotony of style, as if the whole of the articles had come from a single workshop, and the visitor who has examined the contents of one stand has practically seen all. At some of the stands the same articles are exhibited set in a variety of cheap stones—moonstones from Auvergne, having a fine greenish-brownish lustre; absinthe coloured topazes, and garish jewels of brilliant reds and blues. The whole of the exhibits agree in this respect—the wares are uncommonly cheap, and the chief wonder in regard to them will probably be how they could have been produced at the money. Of course it is no secret that these exhibitors have come to Edinburgh not so much for the purpose of showing as of selling their wares. Scottish people, however, are inclined to look with suspicion upon cheap jewellery, and no doubt this accounts in part for the fact that the exhibitors are not finding business so brisk as they looked for. One exhibition of genuine interest which comes within this class is that of M. Leon Ducreux, of 43, Rue Reaumur, Paris. M. Ducreux shows a collection of Gophir diamonds, as they are called, the Gophir diamond being a stone which resembles in its uncut state the rock crystal, and is found in the Pyrenees. It has a very high degree of hardness, and is susceptible of a very fine polish, and when cut in facets like a diamond its purity and lustre are such that no one short of an expert could distinguish it from a real diamond. The stones are set with great care and have been cut in size up to fifty carats, but it has been found that such large sizes tend rather to depreciate their value, and they are usually cut to the most ordinary sizes of the genuine diamond—a circumstance which, to the ordinary eye, increases the difficulty of distinguishing them from the real gem. There is no difficulty, however, in distinguishing the difference in the matter of price, for the Gophir diamond is not more than a tenth of the cost of its carbon relative. The qualities of the Gophir diamond have been but recently discovered, and the stone was exhibited for the first time at the Paris Exhibition of last year. Another class of exhibits in this section which is of general interest is that which illustrates the art of engraving upon glass. One or two firms show the process, which is of great interest. The sole apparatus is a rapidly revolving disc of steel of about two inches diameter, in front of which the operator sits, and which he turns with the foot by means of a treadle. He brings the vessel to be engraved against the edge of the disc, which he treats from time to time with diamond dust, and with no other guides than the eye and his sense of touch, traces upon the glass the most intricate and beautiful patterns. Each of the exhibitors, particularly M. Vessiere, of Baccarat, shows a fine collection of finished wares. Of the other classes of exhibits none is of very general interest. The display of bathers—kid, calf, and sheepskin—is a very fine one, and the exhibitors are numerous. Among miscellaneous exhibits, the art of cameo cutting is shown in great perfection by M. Poinsignong, of Rue de Turenne, Paris, and Messrs Guichard, Potheret, and Sons have a fine exhibit illustrating the application of artistic bronze to household ornamentation.

The Watch Trade.

COMMENTING on the recent conference held at the London Chamber of Commerce, the *Liverpool Mercury* says:—A verbatim report, printed in pamphlet form, of the conference of watch trade representatives of London, Coventry, Prescot, and Liverpool, recently held at the London Chamber of Commerce, has just been received. Readers of the *Mercury*, which was the first journal to take up the grievances of the watch trade, will remember that owing to fraudulent foreign competition the watch industry in England was brought to the verge of ruin. Many of the leading firms, in fact, were completely destroyed, and the workmen engaged in the business were reduced to poverty. In an article published in the *Mercury* in the year 1885, it was stated that "such is the condition of the industry in Prescot that during the past ten years nearly half the watchmakers have been compelled to face the alternative of semi-starvation in their own trade or find a means of living by adopting the profession of a soldier, or, when it was to be had, of labourer in the coal-pits; and many of those workmen who remain only manage to keep the wolf from the door by the exertions of their wives, who go out charing or working in the fields." Successive statesmen, however, after coquetting for a time with the grievances of the watchmakers, became shy of the question, fearing that any remedy to be applied must of necessity be a breach of the principles of free trade. But, after the year 1885, when the industry had reached a state of crisis, it was repeatedly pointed out in the *Mercury* that the remedy did not involve the question of free trade but merely that of fraudulent trade. Subsequently the matter was taken up by Parliament, and clauses relating to the question of foreign-made imitations being marked so as to pass for watches manufactured in England were introduced into the Merchandise Marks Act. That Act has now been in operation for about three years, with the result of stemming the tide of adversity and causing the tide of prosperity to set in. Although the Act has done so much for the trade, it has not accomplished all that is required by those engaged in the industry. Sir Albert Rollit, M.P., chairman of the London Chamber of Commerce, when addressing the recent conference, said:—

We have seen that the trade of Clerkenwell and Islington has indicated a very material improvement since that Act was passed. It may be thought by some that this is a coincidence merely, but I, for one, certainly think the clauses relating to watches have, undoubtedly, had a beneficial influence upon trade. Though the clauses have not very frequently been put into operation, still, I think they have had a preventive action which has proved beneficial to English trade. If the clauses have not affected everything desired of them, I do not think it is difficult to point out one reason why such should be the case. It is this, that although the Legislature provided certain rules to be observed in different trades, they provided no machinery for enforcing the application of the Act. And it was pointed out at the time, that unless that were done, the law could not prove so beneficial as it was hoped it would. The London Watchmakers' Trade Association have taken action in several instances, and it has been found that the cardinal difficulties which have to be contended with are, first, in obtaining sufficient evidence, and then the difficulty arising from the necessity of incurring considerable cost. Those have both been difficulties and burdens hard to bear, but I am glad to say there is now a Bill brought in by my right honourable friend, Mr. Mundella, which places in the hands of the Board of Trade the public duty of enforcing the provision of the Merchandise Marks Act. No doubt when a public department like that, familiar with the requirements and usages of trade, have cast upon them the duty of enforcing the provisions, they will be found more useful than in the past.

Mr. Newsome, one of the largest manufacturers in Coventry, said:—

We in Coventry have found a very great improvement in the watch trade since that Act was passed. Even before the Act was passed, and while the agitation was going on, we noticed an improvement in the trade, because people were very much afraid of importing their foreign watches, which were then being sold as English-made watches. Hence they thought they would get rid of their existing stocks instead of adding to them. That caused the improvement in the English watch trade. After the Bill became an Act the trade rose by leaps and bounds until we are not able to get sufficient men to do the work of Coventry. The wages have increased. I cannot say that the watch manufacturers' profits have increased in the same ratio.

Colonial Silver-plate.—Mr. Evan Jones, the well-known jeweller and silversmith, of 11, Hunter Street, Sydney, has we hear completed, to the order of Mr. Herbert Bowden, of Thursday Island, a beautiful trophy, consisting of a miniature lugger, made of silver, under full sail, competed for in the pearl-shell lugger race, which took place in Torres Straits. The trophy was designed from a builder's model, the dimensions being 10in. in length, 16in. in height from keel to mainmast, and 3in. beam. The hull is a beautiful piece of workmanship, and is set off by two masts and three sails. The rigging, running gear, deck arrangements, and in fact, every detail, have been faithfully carried out. The trophy was on view in Mr. Jones' shop window previous to being despatched to its destination, and was much admired. The majority of the luggers entered for the event, which excited a good deal of interest in Torres Straits, were built at this port.

Rates of Chronometers on Trial for Purchase by the Admiralty at the Royal Observatory, Greenwich,

From July 6, 1889, to January 25, 1890.

Name and Address of Maker.	No.	Whether 2 or 8 days.	Construction of Escapement and Balance, from the description furnished by the Maker.	ABSTRACT OF THE PRINCIPAL CHANGES OF RATE DURING THE 29 WEEKS.									
				Least Weekly Rate.	Extremes of Temperature.	Mean Temperature.	Greatest Weekly Rate.	Extremes of Temperature.	Mean Temperature.	Dif'rence between the greatest and least. (a)	Greatest dif'rence between one week and the next. (b)	Mean Temperature for these two weeks.	Trial No. $a + 2b$.
				s	° °	°	s	° °	°	s	s	° °	
Kullberg, London	4739	2	Auxiliary; palladium spring; reversed detent	— 2·5	91·0 — 92·6 42·4 — 56·9	91·9 50·3	+ 1·2	84·2 — 84·7	84·4	3·7	2·7	74·9 — 91·9	9·1
Kullberg, London	3782	2	Auxiliary; palladium spring; reversed detent	— 6·0	91·0 — 92·6	91·9	+ 1·5	74·0 — 76·1	75·3	7·5	3·8	91·9 — 92·0	15·1
Isaac, London	1775	2	Auxiliary acting on jewels	+ 7·4	64·2 — 69·0 84·2 — 84·7	67·1 84·4	+ 19·2	51·7 — 59·3	56·0	11·8	3·9	75·3 — 51·3	19·6
Sewill, London	4516	2	Auxiliary compensation	— 13·0	61·8 — 69·8	66·0	— 4·0	88·7 — 92·2	90·3	9·0	6·1	64·9 — 84·4	21·2
Mercer, St. Albans	4924	2	Auxiliary compensation	— 7·5	63·0 — 68·1	64·9	+ 7·2	51·2 — 64·8	55·5	14·7	4·3	74·9 — 91·9	23·3
Isaac, London	1785	2	Ordinary balance, with slight additions	— 0·5	91·0 — 96·0	93·5	+ 11·7	54·1 — 58·0 51·2 — 64·8	56·1 55·5	12·2	6·4	84·4 — 93·5	25·0
Pyott, London	902	2	Auxiliary compensation	— 2·5	64·2 — 69·0	67·1	+ 11·7	51·2 — 64·8	55·5	14·2	6·1	90·3 — 57·3	26·4
Nugent Wells & Son, Newport	2858	2	Auxiliary acting in heat	— 4·8	74·0 — 76·1	75·3	+ 8·5	84·2 — 84·7	84·4	13·3	7·2	50·3 — 54·9	27·7
Pyott, London	906	2	Auxiliary compensation	— 1·2	94·3 — 98·8	96·4	+ 9·7	84·2 — 84·7	84·4	10·9	8·6	84·4 — 93·5	28·1
Johannsen & Co., London	3851	2	Auxiliary acting in heat	— 1·5	84·2 — 84·7	84·4	+ 11·5	51·2 — 64·8	55·5	13·0	7·9	57·7 — 74·9	28·8
Johannsen & Co., London	3872	2	Auxiliary acting in heat	— 3·9	94·3 — 98·8	96·4	+ 8·9	44·2 — 57·3	51·3	12·8	8·2	90·3 — 57·3	29·2
Keys, London	978	2		+ 5·2	54·8 — 60·2	57·3	+ 17·4	84·2 — 84·7	84·4	12·2	9·0	64·9 — 84·4	30·2
R. & W. Sorley, Glasgow	$\frac{5}{3933}$	2		+ 0·7	91·0 — 96·0	93·5	+ 17·8	51·2 — 64·8	55·5	17·1	6·8	90·3 — 57·3 74·9 — 91·9	30·7
Tainsh Bros., Cardiff	$\frac{2}{5000}$	2	Auxiliary acting in heat and cold	+ 2·8	44·2 — 57·3	51·3	+ 17·2	61·8 — 66·7	64·9	14·4	9·0	50·3 — 54·9	32·4
C. Frodsham, London	0018	2	C. Frodsham's three-bar compensation balance	— 3·1	94·3 — 98·8	96·4	+ 12·3	61·8 — 69·8 90·9 — 93·3	66·0 92·0	15·4	8·7	90·3 — 57·3	32·8
Kendal & Dent, London	4636	2	Auxiliary compensation	— 4·1	84·2 — 84·7	84·4	+ 10·8	51·2 — 64·8	55·5	14·9	9·1	84·4 — 93·5	33·1
Edward & Sons, Glasgow	4936	2		— 15·1	42·4 — 56·9	50·3	+ 1·6	61·8 — 69·8	66·0	16·7	8·4	75·3 — 51·3	33·5
Moore, Dublin	1818	2	Auxiliary acting in heat	— 5·3	55·3 — 63·8	58·5	+ 10·0	84·2 — 84·7	84·4	15·3	9·3	64·9 — 84·4	33·9
Kendal & Dent, London	4465	2	Auxiliary compensation	— 18·2	42·4 — 56·9	50·3	— 2·8	88·7 — 92·2	90·3	15·4	9·6	75·3 — 51·3	34·6
Nugent Wells & Son, Newport	2847	2		— 6·0	84·2 — 84·7	84·4	+ 8·6	51·2 — 64·8	55·5	14·6	10·2	92·0 — 75·3	35·0
Whyte & Co., Glasgow	4773	2		+ 5·4	94·3 — 98·8	96·4	+ 22·0	74·0 — 76·1	75·3	16·6	9·5	74·9 — 91·9	35·6
Moore, Dublin	1811	2	Auxiliary acting in heat	+ 5·7	74·0 — 75·8	74·9	+ 20·8	51·2 — 64·8	55·5	15·1	10·6	57·7 — 74·9	36·3
Blair, Bristol	1887	2	Auxiliary compensation	— 26·5	42·4 — 56·9	50·3	— 11·1	94·3 — 98·8	96·4	15·4	10·5	75·3 — 51·3	36·4
Hume, Newcastle-on-Tyne	2030	2	Auxiliary acting in heat	— 3·0	74·0 — 76·1	75·3	+ 11·0	51·2 — 64·8	55·5	14·0	11·3	57·7 — 74·9	36·6
Usher & Cole, London	6507	2	Auxiliary acting in heat and cold	+ 9·7	62·0 — 64·8	63·3	+ 28·6	42·4 — 56·9	50·3	18·9	8·9	50·3 — 54·9	36·7
Hume, Newcastle-on-Tyne	2033	2	Auxiliary acting in heat	— 5·1	74·0 — 76·1	75·3	+ 9·1	54·3 — 61·0	57·7	14·2	11·7	75·3 — 51·3	37·6
Johannsen & Co., London	3798	2	Auxiliary acting in heat	— 2·9	74·0 — 76·1	75·3	+ 12·9	42·4 — 56·9	50·3	15·8	11·7	75·3 — 51·3	39·2
Blair, Bristol	1888	2	Auxiliary compensation	— 17·0	94·3 — 98·8	96·4	— 1·4	74·0 — 75·8	74·9	15·6	12·2	74·9 — 91·9	40·0
Keys, London	984	2		— 6·5	42·4 — 56·9	50·3	+ 7·8	88·7 — 92·2	90·3	14·3	13·6	90·3 — 57·3	41·5
Glover, London	366	2	Auxiliary acting in heat	— 7·4	54·8 — 60·2	57·3	+ 12·6	51·2 — 64·8	55·5	20·0	10·8	74·9 — 91·9	41·6
Isaac, London	1687	2	Lamina auxiliary	— 8·8	64·2 — 69·0	67·1	+ 13·1	44·2 — 57·3	51·3	21·9	10·3	75·3 — 51·3	42·5
Sewill, London	4518	2	Auxiliary compensation	— 12·7	91·0 — 92·6	91·9	+ 6·2	42·4 — 56·9	50·3	18·9	11·8	75·3 — 51·3	42·5
Penlington, Liverpool	2517	2	Auxiliary compensation	— 15·4	91·0 — 96·0	93·5	+ 8·6	42·4 — 56·9	50·3	24·0	10·3	50·3 — 54·9	44·6
Isaac, London	1789	2	Palladium spring; Isaac's balance	— 25·0	42·4 — 56·9	50·3	+ 0·9	84·2 — 84·7	84·4	25·9	9·8	75·3 — 51·3	45·5
Mercer, St. Albans	4824	2	Auxiliary compensation	— 17·8	94·3 — 98·8	96·4	+ 1·9	61·8 — 66·7	64·9	19·7	13·7	74·9 — 91·9	47·1
J. Poole & Co., London	5812	2	Poole's auxiliary	+ 0·4	42·4 — 56·9	50·3	+ 18·0	74·0 — 76·1	75·3	17·6	17·5	75·3 — 51·3	52·6
Glover, London	385	2	Ordinary balance, with auxiliary acting in heat	— 3·4	61·8 — 69·8	66·0	+ 27·0	55·3 — 63·8	58·5	30·4	11·2	90·3 — 57·3	52·8
C. Frodsham, London	0017	2	C. Frodsham's three-bar compensation balance	— 4·1	53·7 — 60·0	57·1	+ 20·3	74·0 — 76·1	75·3	24·4	15·4	74·9 — 91·9	55·2
Kendal & Dent, London	1780	2	Auxiliary compensation	— 9·8	42·4 — 56·9	50·3	+ 15·1	91·0 — 92·6	91·9	24·9	21·1	90·3 — 57·3	67·1
Penlington, Liverpool	2520	2	Auxiliary compensation	— 25·2	61·8 — 66·7	64·9	+ 15·2	54·8 — 60·2	57·3	40·4	19·4	93·5 — 96·4	79·2
Schoof, London	6065	2	Schoof's resilient lever escapement	+ 8·8	84·2 — 84·7	84·4	+ 65·0	51·2 — 64·8	55·5	56·2	15·4	84·4 — 93·5	87·0
Hammersley, London	$\frac{1}{1008}$	2	Auxiliary acting at low temperature	— 4·3	64·2 — 69·0	67·1	+ 58·8	51·2 — 64·8	55·5	63·1	12·1	57·7 — 74·9	87·3
Buckney, London	4857	2		— 13·3	64·2 — 69·0	67·1	+ 37·1	90·9 — 93·3	92·0	50·4	23·7	75·3 — 51·3	97·8
Hillgren, London	5	2	Palliard's non-magnetic balance and spring	+ 30·2	61·8 — 69·8	66·0	+ 97·5	44·2 — 57·3	51·3	67·3	17·5	64·9 — 84·4	102·3
Schoof, London	6059	2	Schoof's resilient lever escapement	+ 8·1	94·3 — 98·8	96·4	+ 87·1	51·2 — 64·8	55·5	79·0	33·5	74·9 — 91·9	146·0
Johannsen & Co., London	3794	2	Auxiliary acting in heat	+ 4·2	88·7 — 92·2	90·3	+ 14·4	63·9 — 69·0	66·6	10·2	8·3	57·3 — 90·3	...

The sign + indicates that the rate is gaining.

The Chronometers are placed in order of merit, their respective positions being determined by consideration of the irregularities of rate exhibited in the Table above.
The Trial No. $a + 2b$ is taken as a measure of the irregularities of rate.

Johannsen & Co., 3794. The mainspring of this Chronometer was found broken in the 19th week of the trial. It was removed by the maker on November 20.

Rates of Deck Watches on Trial for Purchase by the Admiralty at the Royal Observatory, Greenwich,

From October 26, 1889, to February 15, 1890.

Name of Maker.	No.	WEEKLY RATES IN ORDER OF TIME.																		ABSTRACT OF THE PRINCIPAL CHANGES OF RATE.					
		Oct. 26 to Nov. 2.	Nov. 2—9.	Nov. 9—16.	Nov. 16—23.	Nov. 23—30.	Nov. 30 to Dec. 7.	Dec. 7—14.	Dec. 14—18. *	Dec. 18—21. †	Dec. 21—24 †	Dec. 24—28. *	Dec. 28 to Jan. 4.	Jan. 4—11.	Jan. 11—18.	Jan. 18—25.	Jan. 25 to Feb. 1.	Feb. 1—8.	Feb. 8—15.	Diff'rence between greatest and least weekly rates. Dial up. *a*.	Greatest difference between one week and the next. Dial up. *b*.	Difference of weekly rates. Pendant up —Dial up *c*.	Pendant right —Dial up *d*.	Pendant left —Dial up *e*.	Trial Number. $a + 2b + \frac{1}{2}(c + \frac{d+e}{3})$
		Watch Horizontal. Dial up.							Watch v'rtical. Pend'nt up.	Watch v'rtical. Pend'nt right.	Watch v'rtical. Pend'nt left.	Watch v'rtical Pend'nt up.	Watch horizontal. Dial up	Watch Horizontal. Dial up.											
		s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	
Ashley	3622	+ 7·0	+10·0	+ 8·5	+ 9·0	+11·3	+ 8·6	+13·3	+15·6	+25·7	+28·0	+20·8	+19·6	+26·2	+24·6	+21·1	+21·6	+20·9	+20·9	19·2	6·6	+ 1·7	+ 9·2	+11·5	36·8
Hall	3651	− 6·6	− 0·6	− 2·6	− 1·2	− 2·2	+ 2·6	+ 1·1	+11·7	−11·9	− 0·2	+ 7·9	+ 7·5	+ 9·9	+ 7·0	+11·9	+10·6	+ 8·9	+ 6·0	18·5	6·0	+ 5·5	−16·2	− 4·5	36·8
C. Frodsham and Co...	07462	+31·2	+34·2	+32·6	+33·9	+33·9	+32·1	+30·1	+50·1	−11·2	+12·4	+30·5	+36·9	+38·9	+43·5	+44·1	+39·6	+37·2	+41·3	14·0	4·6	+ 6·8	−44·7	−21·1	37·5
C. Frodsham and Co...	07586	−20·6	−22·0	−22·9	−21·7	−27·1	−24·4	−18·3	−18·2	−19·8	−38·5	−24·9	−10·6	− 6·5	...	...	...	...	...	20·6	6.1	− 7·1	− 5·3	−24·0	41·3
Buckney	30399	+12·7	+17·8	+10·5	+ 6·7	+ 4·3	+ 2·4	+ 8·6	+35·3	+11·2	− 8·6	+ 4·4	+13·4	+ 2·3	+11·0	+ 5·0	+ 9·2	+ 6·2	+ 6·0	15·5	11·1	+ 8·9	+ 0·2	−19·6	45·5
Ashley	3923	+ 6·3	+ 5·7	+ 3·6	+ 1·5	+ 1·2	− 3·1	− 0·1	− 7·2	−56·0	−34·5	− 7·0	+ 7·6	− 0·7	+ 5·0	+ 8·8	+ 7·2	+ 5·1	+ 2·1	11·9	8·3	−10·9	−59·8	−38·3	50·4
Buckney	30202	+ 8·9	+ 7·3	+ 6·5	+ 7·5	+ 7·9	+ 2·7	− 1·7	−26·3	+37·8	−23·8	−23·6	− 2·0	+ 2·1	+12·1	+12·8	+ 9·0	+ 5·1	+ 2·4	14·8	10·0	−23·1	+39·7	−21·9	56·7
Isaac	10797	− 2·1	− 1·6	− 3·0	− 3·9	− 4·7	− 9·3	−19·0	− 5·4	+ 3·0	−62·5	−31·9	−15·5	− 0·6	− 2·0	− 6·7	− 8·2	−10·2	−10·7	18·4	14·9	− 1·4	+20·3	−45·2	59·8
Hammersley	1/3015	+20·9	+22·9	+22·6	+24·3	+24·2	+21·0	+29·5	+13·1	+13·1	−29·6	− 6·0	+35·8	+28·3	+35·3	+33·9	+31·8	+30·1	+29·1	14·9	8·5	−29·1	−19·6	−62·3	60·2
E. Dent and Co..........	43637	− 5·2	− 3·1	− 4·9	− 7·4	− 6·0	− 5·3	+10·9	+ 5·1	+11·7	+ 6·5	− 2·6	+12·3	− 5·9	− 7·2	− 5·0	− 8·1	− 8·3	− 7·0	20·6	18·2	−10·3	+ 0·1	− 5·1	63·1
C. Frodsham and Co...	07587	+10·8	+10·4	+ 8·7	+10·1	+ 5·4	− 3·2	+15·1	+24·9	+25·9	−13·8	+ 7·6	+23·6	+ 5·1	+ 7·4	+ 6·9	+ 9·4	+ 6·1	+ 2·6	26·8	18·5	− 3·1	+ 6·5	−33·2	72·0
Isaac	10825	− 9·7	−11·6	− 3·5	− 7·0	− 2·8	+ 9·3	+ 1·3	+48·8	−20·3	− 1·9	+21·5	+ 2·4	− 3·5	+ 3·0	+ 6·0	+15·6	+ 9·0	+13·0	27·2	12·1	+33·3	−22·2	− 3·8	72·4
Isaac	10795	−16·5	−15·9	−15·5	−17·0	−16·6	−20·2	− 4·1	−10·3	+19·8	−49·9	−26·4	− 5·3	−19·9	−17·8	−20·1	−20·6	−27·1	−29·0	24·9	16·1	−13·7	+24·5	−45·2	75·6
Brockbank and Atkins	215	+ 7·3	+ 9·8	+11·9	+11·6	+11·3	+15·5	− 7·6	+ 2·8	−28·7	+15·2	+12·6	+10·2	+20·0	+14·1	+20·8	+19·4	+17·4	+18·4	28·4	23·1	+ 6·4	−30·0	+13·9	85·1
Brockbank and Atkins	213	+21·7	+25·6	+23·5	+22·2	+22·3	+21·7	+30·6	+38·1	+37·6	+ 8·2	+30·1	+57·0	+32·1	+32·9	+31·4	+33·0	+33·7	+36·5	35·3	24·9	− 9·7	− 6·2	−35·6	96·9
Buckney	30402	+ 0·4	− 2·6	+ 1·7	+ 7·1	+ 0·8	−24·3	−25·5	−25·9	+51·2	+ 1·9	+ 4·6	−12·1	− 5·8	− 7·5	− 4·8	− 4·0	+ 6·2	+ 2·7	32·6	25·1	+ 8·1	+70·0	+20·7	102·0
Brockbank and Atkins	74212	−25·4	−23·1	−24·6	−24·6	−19·4	−17·2	+ 2·5	+14·0	+21·2	+29·4	+30·1	+20·6	− 4·9	− 6·3	+ 7·0	+ 7·9	+12·1	+18·7	46·0	25·5	+10·5	+ 9·6	+17·8	106·9
Hall	2094	+50·4	+55·0	+56·4	+44·8	+60·1	+44·9	+20·0	+20·3	+38·5	+14·7	+20·8	+60·2	+49·3	+59·4	+57·3	+53·3	+63·8	+66·0	46·0	24·9	−19·5	− 1·6	−25·4	110·1
J. Poole and Co..........	6424	+21·0	+20·8	+20·3	+19·7	+16·0	+14·7	+45·3	+ 9·3	+ 0·9	+14·5	+24·3	+39·9	+17·0	+20·7	+20·6	+23·1	+18·2	+12·9	32·4	30·6	−25·8	−41·7	−28·1	118·1
Hammersley	1/3011	+12·5	+20·5	+23·2	+23·7	+20·0	+13·9	+25·7	+58·1	+20·8	+25·0	+36·8	+18·3	+ 8·0	+ 8·8	+38·8	+60·4	+55·9	+42·8	52·4	30·0	+25·5	− 1·2	+ 3·0	125·9
J. Poole and Co..........	6498	+10·4	+ 9·7	+ 7·9	+ 4·8	+ 5·2	+ 9·2	−24·7	−38·3	−26·8	−12·1	−29·4	−15·9	+13·8	+14·6	+20·5	+20·2	+24·4	+25·6	50·3	33·9	−13·6	− 6·5	+ 8·2	127·4
Buckney	30201	−18·9	−24·9	−21·8	−19·6	−24·3	−43·1	− 7·0	−12·1	+ 2·1	−89·2	−36·9	−45·4	−40·0	−27·4	−22·9	−26·0	−42·4	− 4·8	40·6	37·6	+ 1·7	+28·3	−63·0	131·9
Hall	3005	−31·9	−33·6	−35·5	−37·0	−36·1	−38·9	+10·3	− 4·4	− 5·4	− 7·2	+ 9·8	+19·5	−15·6	−12·5	−14·7	−19·8	−27·8	−27·6	58·4	49·2	−12·2	−20·3	−22·1	170·0
Kendal and Dent	25150	−21·0	−16·1	−15·7	− 6·5	− 1·4	− 6·4	−45·0	+ 6·3	+ 9.1	+55·5	+17·9	−36·7	+ 9·6	+ 4·2	+ 4·7	− 0·4	+ 4·5	+ 7·9	54·6	46·3	+53·0	+50·0	+96·4	198·1
C. Frodsham and Co...	07463	+19·4	+26·2	+24·1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mean Weekly Temperature...		58°·5	57°·7	57°·1	56°·3	53°·8	49°·7	84°·3	84°·3		82°·9		83°·5	54°·9	56°·0	55°·5	55°·5	52°·8	50°·4						
Extremes of Temperature as shown by the Self-Registering Thermometers		55°·3 63·8	54°·3 61·0	53°·8 61·3	52°·0 59·2	48°·0 60·8	44°·0 54·4	83°·2 85·2	83·1—85·5		79·0—85·5		81°·8 85·0	50°·2 59·2	51°·7 59·3	51°·2 64·8	51°·4 59·0	48°·0 58·5	45°·8 55·0						

The sign + indicates a gaining rate.

The quantities *a*, *b*, *c*, *d*, *e*, in the formula $a + 2b + \frac{1}{2}(c + \frac{d+e}{3})$, are taken numerically, without regard to sign.

* The Weekly Rates have been computed from the Rates for four days.

† The Weekly Rates have been computed from the Rates for three days.

During the period Dec. 7 to Jan. 4, the watches were placed in an oven heated by jets of gas, the temperature being regulated by Kullberg's automatic governor which controls the supply of gas. The gas flames are exterior to the chamber, into which none of the injurious products of combustion can enter.

C. Frodsham, 07463. The mainspring of this watch was found broken in the fourth week of the trial. It was removed by the maker on December 30.

C. Frodsham, 07586. The mainspring of this watch was found broken in the twelfth week of the trial, after the trials in position and heat. Its position in the list, having been determined without reference to the duration of the trial, is not necessarily correct.

The Utility of the British Association.

From *Industries*' point of view.

We have before us, says our contemporary, a copy of the report of the British Association meeting last year at Newcastle-on-Tyne. The "success" of the meetings of this association is gauged, it would seem, by the number of persons who attend—a criterion suggestive of a demonstration in Hyde Park. It is to be presumed that the 3,838 persons who were present at the Manchester meeting were influenced more by probabilities of fine weather, the Exhibition, and the facilities afforded by the locality, than by any expectations raised by the presidency of Sir H. Roscoe, or by the anticipated interest of any of the communications. But their very presence made a successful meeting, while Bath only attracted 1,984—a comparatively tame affair—and Newcastle came close to the average of the last nine years with 2,437.

The British Association meetings offer a twofold interest. On the one hand, the transient enjoyment of an assortment of lectures, papers, discussions, excursions, and picnics, (the former being remarkable for a variety of subjects, the latter no less "mixed" from a social point of view); and on the other hand, the real scientific work done. No doubt the attendance roll sufficiently indicates the "success" of a meeting in a certain sense; but the papers read, and the reports presented, are the only real elements of value, apart from the holiday aspect of the Association.

The British Association, as we have before pointed out, has its weak points. It may be compared not unaptly with the Royal Academy, who, in the first place, offer their best accommodation to 280 pictures—*i.e.*, seven from each academician—without any reference whatever to the merits of the picture or of the academician. After these, the productions of the Associates, and selections from those of the public, are accepted. We need not mention the names of those who are always to be found "on the line" at the meetings of the British Association, but we cannot push the Academy analogy far, for in the one case a tangible picture is presented, while in the other there is often not even an old envelope with a few notes on the back, and if we wish to study the extempore "communication" in any other way than by listening to the speaker we must wait until perhaps long after the meeting has been dispersed, with the hope, frequently not to be fulfilled, of finding some of it in print. The Royal Society and the British Association are perhaps at the two extremes on the scale of real usefulness in publication of sound, scientific work. Anyone is welcome to send a paper to the former, and the "communication" is a paper and not a mere discourse. It is referred to some high authority, who most carefully deliberates, frequently, we believe, calling in the advice of brother Fellows as to the true value and originality of the work which it embodies. The British Association, on the other hand, appoints secretaries for its different sections, and the chief business of not a few of these is to persuade members to "send a paper." After sufficient persuasion the member probably gives his promise and the title of his "paper." As the time draws near he is asked to send an abstract; should he do so it will probably appear in the report—a bulky volume published some seven or eight months after the meeting. Should he decide otherwise, he has only then to consider whether he is inclined to keep his promise, in which case he goes to the meeting and has "his say." A sufficiently interesting title and a chat with the secretary will secure the "acceptation of the paper by the committee," if the author is not a well-known faddist or advertising manufacturer. No shorthand reporter is in attendance, unless on behalf of some journal; no official cognisance is taken of any discussion that may arise, although, in most scientific societies, the discussions are often of a value at least equal to that of the paper. In our hypothetical case, which is not exceptional, the interesting title and the author's name appear in the report, and that is the end of the matter. Happily there are cases where the author attaches some value to his own communication, and he will send in his abstract, and perhaps a copy of his paper. He will in many cases prepare, and send to the meeting, specimens, or apparatus for experiments, or diagrams; he may secure the attendance of a reporter for some journal, in order that the discussion may be recorded; but after all he may find that the very men to whom he wishes to communicate his work are away at a committee meeting, or are at a meeting of a kindred section.

AUG 16 1890
U. S. PATENT OFFICE.

In the report for 1889 we find, in Section A (mathematical and physical), no less than fourteen titles of reports and papers with no abstract, and no information is given as to whether they have been published elsewhere. The abstracts of seven other papers average less than four lines to each. The other sections are treated in a similar manner, with the exception of Section G (mechanical), where papers containing new matter are seldom to be found, but where an opportunity is afforded for discussion. Here we find foot-notes referring to technical journals where abstracts, or the papers *in extenso*, are to be found. It may be pleaded that the expenses of printing will not allow any further space to be devoted to publication of the papers and reports, but a glance at the volume before us is sufficient to show that it is impossible to find any one reader who can be interested in all the immense range of science with which it deals. The volume contains 1,171 pages, exclusive of the publisher's advertisements. Of these, 124 are devoted to the rules, historical list of officers, balance sheet, lists of committees, the president's report, and another 171 contain the list of members and the index, making 295 pages, which are supposed to interest all members. The remainder, divided by the number of sections, gives about 110 pages to each. If these were issued separately, allowing, say, two sections to each member who applies (though he should not be restricted to this number), about two-thirds of the printing would be saved by this change alone. If double the present space were allowed for the reports and proceedings of each section there would still be a saving of more than one-third, still allowing an average of two sections to each member applying.

The limits of our space will not allow a discussion of the work of the committees. Much good work has been done by them, assisted by grants of money, but at the conclusion of their labours there is no one to whom to refer. An instance of this occurred last year, when the London Chamber of Commerce wished to push the B.A. standard screw thread, which was the outcome of a considerable amount of labour. But the committee had been dissolved and there was no committee or individual who could render any assistance whatever. For more than eleven months of the year the British Association has no other abode than rooms shared by, or in connection with, the Royal Asiatic Society, the Society for the Promotion of Hellenic Studies, the Aristotelian Society, and the Numismatic Society, and other miscellaneous institutions. The officers are, with one exception, we believe, all honorary Under these conditions we fear that it must continue to be rather an association for the organisation of an annual scientific holiday than for the advancement of science.

At about this time of year the committees begin to meet to arrange for the forthcoming autumn, and we trust that, though there may be some difficulty among eight sectional committees and sixty-five working committees, a general committee, and a council, in arriving at any useful conclusion, an endeavour will nevertheless be made to promote some solidarity and joint responsibility of the body as a scientific society, and that measures will be taken for properly recording the work done.

The Burmah Ruby Mines.—After all the noise that was made about the Burmah ruby mines concession, it seems that the shareholders, and not the outside public, have the worst of the bargain. At the meeting of the company, held in London in the beginning of the month, the Chairman was obliged to confess that they had worked for a year without finding any rubies which were of any value. They had great confidence in the future, but meantime they were most anxious that the Indian Government should forego the rent until there was something to pay rent with. This state of matters the *Leeds Mercury* thinks compares sadly with the gorgeous descriptions of Burmah's hidden treasures given a couple of years ago.

On the Electro-Deposition of Platinum.

By Dr. Wm. H. Wahl.

[*Read at the Stated Meeting of the Chemical Section of the Franklin Institute, May 20, 1890.*]

THE permanence and unalterability of the metal platinum—properties which make it of such inestimable value to the chemist—have likewise suggested its application as a protective covering upon the surfaces of other metals; and, even in the early days of the art of electro-deposition, efforts to obtain a satisfactory coating of this metal were made. The failure with which these early experiments were attended served rather to stimulate than to deter subsequent investigators, and the problem has received the attention of a number of the most noted experts in the art. The results that have been accomplished cannot be said to have been entirely satisfactory—a statement which, I believe, will be fully sustained by the fact that electro-plating with platinum, on the commercial scale, is practised only to a very limited extent. When the wide field of application for platinum-plating is considered—and I need only name philosophical, engineering, surgical, dental and electrical apparatus and instruments, fire-arms, watch-cases, and jewellery, to say nothing of the host of miscellaneous articles of utility and ornament to which the metal could be advantageously applied—the conclusion is warranted, that the processes thus far proposed for the purpose do not fully meet the requirements of practical service.

Thus far, of all the methods that have been proposed for electro-plating with platinum, three only appear to have sufficient merit to deserve special notice; these are:—

(1) Roseleur-Lanaux' method, based on the electrolysis of a solution of the double phosphate of sodium and platinum.

(2) The process of the Bright Platinum Plating Company (of London), a modification of that of Roseleur, involving the introduction into the bath of certain substances, such as sodium chloride and borax, to ensure a bright deposit of the metal; and

(3) Boettger's method, founded on the electrolysis of a solution of the double chloride of ammonium and platinum in sodium citrate.

Each of these baths will yield satisfactory results for a time; but, as I shall endeavour to show, the peculiar difficulties met with in the practice of platinum-plating render it impossible to maintain the chemical integrity of these electrolytes, and, in consequence thereof, they soon become inefficient or inoperative by reason of contamination with the secondary products formed therein.

I will endeavour in what follows to give the true explanation of the difficulties above referred to, and to indicate what, from a careful study of the subject, fortified by the results of numerous experiments, I conceive to be the only feasible method of overcoming them.

The first difficulty encountered is that of obtaining a bright, reguline and adherent deposit of the metal, in which form only it will answer the demands of practice. There is no difficulty in effecting the separation of the metal from solutions of almost any of its compounds. Zinc, iron, and tin reduce it promptly by simple immersion, and this very facility of reduction is one of the reasons why, even by the method of electrolysis, the desired object is frequently accomplished only in an imperfect manner; for the electro-plater is obliged to meet and overcome its obstinate disposition to separate from many of its compounds in the condition of platinum black, lacking coherence and adherence, and therefore entirely unsuited for his purpose.

Another and no less serious difficulty arises from the insolubility of plates or sheets of this metal as anodes, when solutions containing platinum salts are submitted to electrolysis. In electro-plating with copper, silver, gold, and nickel but little difficulty is encountered in practice on this account, since anodes of these metals are freely soluble in many solutions capable of depositing them when they are submitted to electrolysis, and the rate at which these anodes are respectively dissolved, approximates so nearly to that at which the metals are deposited upon the objects at the cathode, that the metallic strength of the electrolyte is maintained substantially constant, and electro-plating solutions of these metals may be operated for a long time without requiring additions of metallic salts. The electro-deposition of the metals whose anodes are thus tractable is carried on industrially with success.

It results from this want of solubility of the anode that the metallic strength of the electrolyte employed is continuously being weakened, while the deposition of the metal is going on, and the conductivity of the bath is being continually modified thereby. The character of the deposited metal also is injuriously influenced by these constant alterations of condition in the bath; and, as the rate of deposition becomes slower and slower by reason of the gradual impoverishment of the metallic strength of the solution, it becomes necessary to restore it by fresh additions of metallic salt. The practice in all the processes of electro-plating with platinum employed up to the present time, save that of Boettger, is to use for this purpose the tetra-chloride of platinum. With this single exception, all the solutions for the electro-deposition of platinum thus far made known, so far as I am aware, are made by treating the chloride with compounds of the alkalies, soda, potassa, or ammonia. Of these, the phosphates and oxalates of soda, or potassa, are in greatest favour, and a number of formulæ for preparing platinum-plating baths with their aid have been described. The resulting substance is commonly a double salt, such, for example, as the double phosphate of sodium and platinum; the double oxalate of potassium and platinum, etc., contaminated, however, in each case by the chloride of the alkali employed, which is formed from the decomposition of the platinic chloride. As often as it is found necessary to strengthen the bath, fresh additions are made of platinic chloride, which, by chemical interaction with the constituents of the bath, aided by the process of electrolysis, yields more alkaline chloride; and it follows that the bath, by reason of becoming surcharged with this foreign substance, and with other secondary products of electrolytic decomposition, ceases to yield bright, reguline platinum upon the articles to be plated therewith and must be discarded. It then becomes necessary to regain the platinum contained in the discarded bath, by one or another of several processes of reduction known to chemists. The platinum thus regained may be converted into chloride and utilized in the preparation of a fresh bath, with which the same series of operations may be repeated. Boettger purposes to maintain his bath by fresh additions of his original solutions, but it must be apparent that the continued electrolysis of such a solution as he employs must be attended with the constant accumulation therein of alkaline chlorides from the same causes as those specified above. This rapid deterioration of the baths, therefore, involves their frequent renewal at the expense of time and labour, so that, in spite of the fact that there is a wide field for its application, it is principally for this reason that the art of electro-plating with platinum on the commercial scale has thus far been practised only to a very limited extent.

It occurred to me that it might be practicable to overcome the principal difficulty here set forth. Knowing the influence of extent of surface in promoting the solubility of substances, it appeared to me at least probable that if the platinum were exhibited at the anode in the form of platinum-black, or sponge, exposing thus an enormously greater number of points of attack to the electro-negative element or acid radical there set free, the result might be the solution of the platinum, and the problem of maintaining the metallic strength of the electrolyte would thus be solved. The correctness of this conjecture was verified by experiment. For this purpose a plate of porus battery carbon, previously treated with boiling hydrochloric and nitric acids, was saturated repeatedly with a solution of platinic chloride and dried. It was then introduced into a graphite crucible, finely divided carbon was packed about it, and the crucible and contents heated for about half-an-hour to bright redness. The carbon plate then contained within its pores platinum in a state of eminently fine division. Treatment with water, and with hydrochloric acid at boiling temperature, failed to leach out any platinum salt, showing that the previous treatment had sufficed to reduce all the platinum salt to the metallic state. The carbon plate was then suspended as the anode in moderately diluted hydrochloric acid, a platinum plate serving as the cathode. The acid bath was gently heated and a current of moderate strength was allowed to flow through it. There was a liberal evolution of hydrogen from the cathode, but little perceptible evolution from the anode. The acid solution gradually became coloured from the formation of platinic chloride, and after some time the bright surface of the cathode began to blacken and ultimately became covered with a thick coating of platinum black. It was thus demonstrated that an anode of platinum, in the state of fine division is readily soluble in an electrolyte which yields chlorine at the anode when the same is electrolyzed. This observation, so far as I am aware, is new. It proved, however, to have no practical value, since the solution of the anode demanded the presence of a large proportion of free acid in the plating-bath and the use of current of such strength as to produce invariably the deposition on the surfaces to be plated, of black and non-adherent metal. Furthermore, it was found as was to have been anticipated, that the physical condition of the anode exerted no influence whatever in the electrolysis of baths formed of the oxysalts of platinum, from which the best results in electroplating are obtained—since, in electrolyzing such compounds, the acid radical separated upon the surface of the platinum black failed to exert any perceptible solvent action.

It was therefore necessary to devise some other plan for overcoming the difficulties herein described, and, after making a number of fruitless experiments, I was so fortunate as to find a plan which appears to offer a solution of the troublesome problem of electro-plating with the group of metals, whose anodes are insoluble, in a more satisfactory manner than any other that has hitherto been suggested.

The plan here referred to consists in employing platinum hydroxide for the purpose of maintaining the metallic strength of the plating-bath. For this purpose, the hydroxide, which is readily soluble in alkalies and in many of the acids, may be introduced into the plating-bath from time to time and dissolved therein by stirring, or it may be permitted to remain in the bath in excess, the undissolved portion remaining at the bottom of the containing vessel, or it may be suspended in a canvas bag adjacent to or surrounding the anode of carbon, according as the nature of the electrolyte may indicate one or the other method to be the preferable one. As the solutions which yield the best results in plating are those of the oxygen salts, I have found it advantageous also to prepare these directly from the hydroxide. This method, I have found, is capable of yielding a number of electrolytic baths of platinum that will maintain their metallic strength approximately unimpaired during electrolysis, and without the objectionable features of introducing into them substances that will cause them to deteriorate by the accumulation therein of injurious secondary products of decomposition, as is the case where such baths are maintained by additions of platinic chloride or alkaline chloro-platinates, as has hitherto been the invariable practice. Referring now specifically to the properties that render the platinic hydrate useful for the purposes above indicated, the following points appear to be deserving of mention.

It is readily soluble in aqueous solutions of the alkaline hydrates, and in a number of acids, mineral and vegetable. In the treatment of the platinic hydrate with aqueous solutions of the alkaline hydrates, the former plays the part of a weak acid forming compounds known as platinates, which are very soluble, and from which the platinum is not precipitated on the addition of an excess of alkali. A weak aqueous solution of sodic or potassic hydrate (but especially the last-named) will dissolve a large quantity of platinic hydrate, at the ordinary temperature, though solution takes place more freely, when heat is applied. These solutions have the advantageous features of being freely conductive of electricity, and of yielding bright, reguline, and adherent electro-deposits of platinum on metallic surfaces previously prepared to accept the same. Furthermore, with a current of moderate strength, the platinic hydrate only is affected, as is shown by the pronounced evolution of oxygen at the anode and by the total absence of gas at the cathode. Also, it is manifest from the free solubility of platinic hydrate in alkaline hydrate, even in the cold, that if free platinic hydrate be present in a bath of alkaline platinate, the alkali set free in the process of electrolysis will combine with this platinic hydrate to form fresh platinate. For this purpose it will be necessary either to have present in the bath at all times a small excess of platinic hydrate which may remain upon the bottom of the containing vessel, without interference with the plating, and which may be replenished from time to time; or, to introduce at the end of the day's work, a quantity of the platinic hydrate sufficient to restore the metallic strength of the bath to normal, assisting the solution of the metallic hydrate by stirring, and if necessary by the application of gentle heat. As I have found that the platinate solutions act best when they contain a considerable excess of free alkaline hydrate, being more conductive of the current and yielding the platinum more freely and in the best condition, the addition of the proper quantity of platinic hydrate at the close of the day's work in the case of a bath of considerable volume, or the addition of small quantities at intervals, in the case of a small bath, will be found to answer the desired purpose of maintaining the metallic strength of the bath approximately normal for an indefinite period. In a bath where considerable free alkali is present, the platinic hydrate added as just indicated, dissolves very freely even in the cold. The important fact is to be noticed, that the alkaline platinate solutions may be maintained and operated for a long time in the manner described, since no deleterious secondary products are formed by electrolysis to vitiate and render them inoperative, as will speedily be the case where the platinic chloride is used for this purpose. The mineral acids (hydrochloric, nitric, sulphuric, and phosphoric acids), dissolve the hydroxide freely, as likewise do certain of the vegetable acids, notably oxalic acid, and form with corresponding salts of the alkalies, double salts, many of which are soluble in water. Of the salts thus capable of being formed, however, so far as I have been able to determine by experiment, only a limited number appear to be adapted to yield a deposit of bright, reguline and adherent platinum. The halogen compounds may obviously be prepared more conveniently by the direct solution of the metal in *aqua-regia* than by the method I have described, but as I have found the oxygen compounds of platinum to yield much more satisfactory results, I therefore exclude them from consideration.

Of the salts that may be formed from platinic hydrate by solution in acids (and in part by suitable combination with the corresponding alkaline compounds to form double salts), three only may be named as sufficiently useful to yield practically valuable results in plating. These are the phosphates, oxalates, and acetates, of which also it is practicable to form double salts with the alkalies, soda, potassa, and ammonia, which yield bright, reguline, and adherent plating.

Oxalic acid, so far as I have been able to determine, is, of all the oxygen acids, the best solvent of platinic hydrate, dissolving it even in the cold, but with great energy when aided by heat, and forming platinous oxalate, with evolution of carbonic anhydride. From this brownish-black or deep blue solution (according to concentration), brilliant reddish-brown scales of the salt separate abundantly and readily from the hot saturated solution. A saturated aqueous solution of the simple oxalate prepared from the hydrate as above described, will yield bright, reguline, adherent platinum when electrolyzed with a comparatively weak current, with evolution of carbonic anhydride at the anode. With a stronger current hydrogen also appears at the cathode. This bath may be maintained indefinitely at normal metallic strength by observing the precaution to add oxalic acid and platinic hydrate in small quantities from time to time; or by keeping constantly at the bottom of the bath some platinic hydrate, and adding oxalic acid in crystals or powder from time to time as may be required to keep the bath saturated; or, what is much to be preferred, making a supply of platinous oxalate from platinic hydrate in the manner previously described and keeping an excess of this present in the bath at all times. This bath has the same advantages as are possessed by the above-described alkaline platinate baths, of being capable of indefinite maintenance at normal metallic strength and of introducing no substances that will cause its deterioration by the formation of secondary decomposition products.

Phosphoric acid also is a solvent of platinic hydrate. A dilute aqueous solution of this acid will dissolve a small quantity of the metallic hydrate in the cold, and a much larger quantity when aided by heat. With increasing concentration, the solvent power of this acid for platinic hydrate is correspondingly increased. The resulting solution of phosphate of platinum according to the degree of concentration, will be wine-yellow to cherry-red in colour, and with a comparatively weak current, will yield bright, reguline, and adherent platinum on metallic surfaces properly prepared to accept the same. The electrolysis of this compound also, does not involve the formation of deleterious secondary products, the result of the operation being the separation of the metal at the cathode and of the acid radical at the anode—and of the elements of water which are evolved as gases respectively from anode and cathode. In the operation of the bath, therefore, it will become more and more acid as the metal is withdrawn by the accumulation therein of the phosphoric acid set free at the anode. The maintenance of the metallic strength of the bath, therefore, may be effected as in the foregoing cases by having present therein at all times a small quantity of platinic hydrate or by the addition at the end of each day's work of the quantity of the metallic hydrate which will be required to restore the amount of metal withdrawn. This bath must be worked very acid, and the solution of the platinic hydrate to maintain the strength of the bath must be facilitated by heating, as the solvent power of phosphoric acid for platinic hydrate is much inferior to that of oxalic acid. The double phosphates of platinum with certain of the alkalies may be formed, which will be capable of yielding a deposit of bright, reguline, and adherent metal, and of being maintained approximately at normal metallic strength in the same manner as I have set forth above. I have obtained the best results with the ammonio-platinic phosphate, prepared by adding to the solution of platinic hydrate in phosphoric acid sufficient aqua ammoniæ to cause the same to give an alkaline reaction, which point will be indicated by the formation of a grayish precipitate that will not disappear on stirring; then restoring the acidity of the solution by adding free phosphoric acid in excess, upon which the precipitate readily dissolves. The resulting solution is yellowish or brownish, and yields superb plating; though, on account of the greater difficulty of maintaining its metallic strength by the solution of the hydroxide, it is not so well adapted as the oxalate for the work of electro-deposition on the large scale. The sodia-platinic phosphate, formed in a manner precisely analogous to the ammonia compound just described, will also yield bright, reguline, and adherent plating; but I have observed that the soda salt is less freely soluble than the corresponding ammonia compound, and consequently more difficult than the latter to maintain of normal metallic strength.

Platinic hydrate is only very sparingly soluble in strong acetic acid, and it is impracticable to facilitate the solution by boiling, since by persisting in this for a very short time, the hydrate is decomposed and black platinic oxide is formed, which is quite insoluble in this menstruum. I have found, however, that an alkaline acetate bath may be prepared by the addition to the alkaline platinates above described, of as much acetic acid as may be introduced without causing the formation of a permanent precipitate. But although the appearance and quality of the plating obtained with this bath leave nothing to be desired, the bath does not meet the requirements in respect of indefinite maintenance in normal metallic strength and uniform composition. This difficulty, however, as I have observed, becomes less and less pronounced as the bath is made more strongly alkaline, when it approximates more and more closely to the alkaline platinates; for it is obvious that in the presence of a large amount of free alkali, this would unite with the acetic acid to form a simple acetate. The resulting solution would no longer contain sodio- (potassio-) platinic acetate, but sodic (potassic) acetate, sodic (potassic) platinate, and free alkali. Nevertheless, the presence of acetic acid in such alkaline bath appears favourably to influence the quality of the plating yielded, giving the deposited metal a whiteness approaching that of silver; and since furthermore, acetic acid yields only the elements of water and volatile compounds when electrolyzed, and therefore does not contaminate the electrolytic bath by forming deleterious secondary products, I find its judicious addition to the above-described alkaline platinate baths to present some advantages.

The foregoing comprise the compounds that I have found to yield the most satisfactory results in platinum plating, and I will not tax your patience at this time by an enumeration of the results, either partially successful, or wholly unsuccessful, that I have obtained with a number of differently constituted compounds of this metal.

I append directions for the preparation of the several electrolytic baths above described, and indicate what I have found to be the most favourable conditions for working them.

In conclusion, I desire to make known the fact, which was brought to my knowledge only within the past week, that my friend, Prof. Wm. L. Dudley, of Vanderbilt University, Nashville, Tenn., has independently worked out the problem of electro-plating with iridium in a manner precisely analogous to that which I have herein described with platinum. Prof. Dudley has made no publication of his research, but in a letter informs me that he employed, as long ago as 1886, the following procedure, which I quote: "a bath of the metal may be composed of either the chloride ($IrCl_4$), the double chloride of iridium and sodium, or a double sulphate of iridium-ammonium. The latter was preferred. The bath was kept saturated with metal by suspending canvas bags in the solution (either near to or around the anodes) containing the hydroxide of iridium."

Directions for preparing the Electro-plating Baths.—For the alkaline platinate bath, the following directions may suffice:

Platinic hydrate	2 oz.
Caustic potassa (or soda)	8 oz.
Distilled water	1 gallon.

Dissolve one-half of the caustic potassa in a quart of distilled water; add to this the platinic hydrate in small quantity at a time, facilitating solution by stirring with a glass rod. When solution is effected, stir in the other half of alkali dissolved in a quart of water; then dilute with enough distilled water to form one gallon of solution. To hasten solution, the caustic alkali may be gently heated, but this is not necessary, as the platinic hydrate dissolves very freely. This solution should be worked with a current of about two volts, and will yield metal of an almost silvery whiteness upon polished surfaces of copper and brass, and quite freely. There should be slight, if any, perceptible evolution of hydrogen at the cathode, but a liberal evolution of oxygen at the anode. I have observed that the addition of a small proportion of acetic acid to this bath improves its operation where a heavy deposit is desired. The anode may be of platinum or carbon, and owing to the readiness with which the metal is deposited an excess of anode surface is to be avoided. Articles of steel, nickel, tin, zinc, or German-silver, will be coated with black and more or less non-adherent platinum; but by giving objects of these metals a preliminary thin electro-deposit of copper in the hot cyanide bath, they may be electro-platinised in the alkaline platinate bath equally well as copper. The bath may be worked hot or cold, but it is recommended to work it at a temperature not exceeding 100° F. It may be diluted to one-half the strength indicated in the formula, and still yield excellent results. The surface of the objects should be highly polished by buffing, or otherwise, prior to their introduction in the bath, if the resulting deposit is designed to be brilliant.

The deposition of platinum takes place promptly. In five minutes, a sufficiently heavy coating will be obtained for most purposes. The deposited metal is so soft, however, that it requires to be buffed very lightly. A heavier deposit will appear grey in colour, but will accept the characteristic lustre of platinum beneath the burnisher.

The oxalate solution is prepared by dissolving one ounce of platinic hydrate in four ounces of oxalic acid and diluting the solution to the volume of one gallon with distilled water. The solution should be kept acidified by the occasional addition of some oxalic acid. The simplest plan of using this bath, and which requires no attention to proportions, is simply to work with a saturated solution of the oxalate, keeping an undissolved excess always present at the bottom of the vessel. An addition of a small quantity of oxalic acid now and again will be found advantageous. The double salts of oxalic acid with platinum and the alkalies may be formed by saturating the bin-oxalate of the desired alkali with platinic hydrate, and maintaining the bath in normal metallic strength by the presence of an undissolved residuum of platinous oxalate.

The double oxalates are not so soluble in water as the simple salt. The oxalate baths, both of single and double salts, may be worked cold or hot (though not to exceed 150° F.), with a current of comparatively low pressure. The metal will deposit bright, reguline, and adherent on copper and brass. Other metallic objects must receive a preliminary coppering as above. The deposited metal is dense, with a steely appearance, and can be obtained of any desired thickness.

The deposit obtained in the oxalate baths is sensibly harder than that from the alkaline platinate bath, and will bear buffing tolerably well.

The phosphate bath may be prepared by the following formula :

Phosphoric acid, syrupy (sp. gr. 1·7) ...	8 oz.
Platinic hydrate	1-1½ oz.
Distilled water	1 gallon.

The acid should be moderately diluted with distilled water, and the solution of the hydrate effected at the boiling temperature. Water should be added cautiously from time to time to supply that lost by evaporation. When solution has taken place, the same should be diluted with sufficient water to make the volume one gallon. The solution may be worked cold or warm to 100° F., and with a current much stronger than that required for the platinates and oxalates. The ammonio-(and sodio)-platinic phosphates may be formed from the simple phosphate by carefully neutralizing the solution of the phosphate with ammonia (or soda) ; then adding an excess of phosphoric acid, or enough to dissolve the precipitate formed and an additional quantity to ensure a moderate amount of free phosphoric acid in the bath. The phosphate baths will be maintained of normal strength by additions of platinic hydrate, the solutions of which will have to be assisted by heating the bath, preferably at the close of each day's work. The metal yielded by the electrolysis of these phosphate solutions is brilliant and adherent. It has the same steely appearance as that exhibited by the oxalate solutions, but to a less pronounced degree. The physical properties of the deposited metal are in other respects like those described in connection with that obtained from the oxalate baths.

New Gem Company.

WITH the title of the Sapphires and Rubies of Siam, Limited, a company has been formed to purchase and work a concession, for 25 years, of the Chantaboon and Krat Gem Mines, with all lands for the purpose of mining round these mines of an area of 40 square miles, to be selected by the concessionaires. The company has also agreed to purchase, when issued, another concession known as the Streeter-Benson concession, for well-known sapphire and other mines in the province of Batambong. The report of Mr. H. Maxwell Stuart, who, from personal knowledge of the properties and the gems they produce, is said to be an acknowledged authority, shows that the sapphires from Batambong mines amount to more than half the world's supply, while the rubies come mostly from the mines in Chantaboon and Krat. He estimates the value of the sapphires and rubies taken annually from these mines in excess of £100,000, while other gems of inferior value are said to be found. The report of Mr. Edwin W. Streeter, also quoted in the prospectus, confirms the above estimate of the actual exportation from the mines, and, with new appliances and proper supervision, it is anticipated that the company's output will exceed £200,000 per annum. It is stated that one of the principal gem brokers in London has certified to having sold in 1889, sapphires coming from Siam for nearly £70,000, and rubies for £20,000. The company's capital of £300,000 is divided into £1 shares, of which 100,000 are to be issued to the vendors in part payment for the concession, and the subscription for half the remainder is guaranteed.

Low Prices and Cut Profits.

THE title chosen for our present article will, perhaps, scarcely fulfil any expectations that may have been raised by the concluding paragraph of our last month's paper. Nevertheless, it suggests thoughts well worthy of serious consideration, and we may even find in it some germs of that new system which shall "tend greatly to minimise the effects of bad trade" as per our promise.

It is undoubtedly a fact that prices have come down greatly within the last few years. To a certain extent, probably, this is due to quicker modes of work and cheaper methods of production. Dies and tools have largely superseded the older hand-work, and stamped goods are now sold in grosses where years ago the heavy wrought articles were invoiced in ones and twos. So far, good. It matters but little whether cheap or expensive goods are made and sold so that workmen and manufacturer get a fair return for their labour and their capital. This production of cheap and showy articles in both silver and gold has been of vast assistance to the trade. There are thousands of purchasers who can afford twenty shillings for a gold brooch to every single one who can give a five-pound note for such. And in catering for this lower but more abundant demand, the trade has wisely followed the lines of self-preservation. The lowering of prices as here instanced has been quite legitimate, and has simply followed the lesser cost of production. Clearly, we have nothing to say against this, but would rather accept it as evidence of vitality and adaptability on the part of the trade at large, indicative of an increasingly prosperous future. There will always be full scope for the disposal of high-class and expensive jewellery, and doubtless there will always be manufacturers anxious to devote themselves entirely to its production. But for fullest growth and completest development, the bulk of the trade will have to give their chief attention to satisfying the demands of this lower and middle-class clientage whose call is for cheapness.

There is, however, another form of "low prices" from which the trade has suffered and is still suffering. It is the illegitimate offspring of internal strife—maker *versus* maker, master against man—and it is with this subject that we are now principally concerned. Its essential elements are inferior materials and bad workmanship, culminated by starvation wages for the workman and cut profits for the master. Here it is that we find the real curse of the trade, and it is to these causes, far more than to any actual dearth of orders, that the melancholy cry of bad trade has been echoed and re-echoed amongst us, until we have been almost forced to believe it as a fact. Consider for a moment what has been the prevailing reply during the period referred to, to any enquiry as to "How's trade ?" "Oh, we have got pretty well of work, but really prices are at such a pitch that we might almost as well shut up." Does not this give the keynote to our chronic grumbles for some long time past ? And it points to a state of affairs that requires speedy and effective alteration. With a view to well ventilating this all-important subject of low prices and cut profits, let us give a little consideration firstly to its cause or causes, then to its effects, and finally to its possible or probable remedies.

It is not usual, we know, to transplant business into the realm of morals, nor to ascribe mental causes to the tricks of trade; but there is no doubt whatever that innate selfishness is at the root of all this false economy. It is exaggerated and unhealthy competition, the desire to crowd out every supposed opponent, to undersell every imaginary rival, that is answerable for this constant and ruinous reduction of prices. This is, however, both a murderous and a suicidal policy. In undermining the profit of our competitors we of necessity reduce our own margin of livelihood; and in mutual "throat-cutting" our own lives are likely to be sacrificed.

But even this does not satisfactorily answer the question "Why do prices come down?" There must be some prior reason; some inherent necessity; or all these evils would have no existence. We must confess to being quite unable to dogmatise on this point. Are there too many in the trade? or is the trade trying to force a much larger consumption than there is a legitimate demand for? Either or both of these forces may be in operation, and would tend to the unfortunate results we are treating of. Or again, is it the increasing numbers of "little men" who, working from hand to mouth, and fully satisfied if they can realise by their week's work an average workman's wage, are enabled to put upon the market goods at a price that no genuine manufacturer with capital in his business could possibly compete with? To what extent this is the case we cannot definitely say. The number of such men and the quantity of work they produce is but small compared with the bulk of the trade; but doubtless they have some share in helping downwards the already declining prices.

There is another matter to which we would collaterally allude, not as explanatory, but rather as seeking information. We may make up a given article in bright or coloured gold (quality indefinite in either case) and we may sell it at a given price. If, however, we make up the same article in nine-carat or fifteen-carat, and have it Hall-marked, then immediately the price obtainable for it falls. Why is this? There seems no reason at all in it. Surely gold of nine-carat or fifteen-carat guaranteed quality is of greater value than that which may be of only six-carat or twelve-carat quality; while, be the cost of Hall-marking little or much, it certainly adds something to the cost of each article. But instead of recovering this extra expense as we might naturally expect, we find in fact that we have to sacrifice both this and a great portion of our normal profit. Thus we see that the Hall-mark stands at once as the symbol of both greater and less value; of higher worth to the purchaser and lower price to the seller. Again we ask, why is this? We utterly fail to see the logical sequence of the matter. Can Mr. Watherston give us any enlightenment in this direction?

Resuming then our former thread, we notice further that this low price and cut profit principle is not confined to the cheap classes of goods, but follows into the better and more expensive work where presumably there is little actual necessity for it. It really seems as though manufacturers and factors were, in many instances, gratuitously cutting down their reasonable profits out of sheer stupidity. We firmly believe that in fancy articles of, say, £10 and upwards each, a ten per cent. more or less would make absolutely no difference to the buying public, while it makes *all* the difference between profit and loss to the maker or vendor. And yet, apparently without reason, they keep on cutting down until there is no profit left at all. After further consideration we can only ascribe it to the before-mentioned effort to force a larger sale than the demand warrants.

The effects of this mistaken policy are varied, but are all alike disastrous. The first in importance is, of course, that very diminution of profit of which we have already said so much. And is not this serious enough? To lose the results of our work and our thoughts; to give our mental and our physical energy for nothing; to waste our lives in fruitless labour—this is what low prices and cut profits mean to all associated therewith; both masters and men suffering together. Further, the mutual jealousy existing between maker and maker, and the scarcely concealed mistrust which operates between maker and factor, are equally traceable to the same absurd system. These things need not be. They are cankerous growths which seriously hamper the conduct of business, and they might readily be obviated by more straightforward relations and less stupid hostility between the various sections of the trade. Times of depression, when orders are scarce and work hard to find, are always followed by a series of minor evils, and the undignified scramble for what call there is, and at any price, is one of those which lasts long into the brighter era.

The worst feature of these "cut profits" is that they have as it were an accumulative effect; ever tending lower and lower. One maker offers a thing to-day at a certain price, and to-morrow another maker brings it out at so much less. This week a factor will advertise chains at so much per ounce, while next week a similar line is quoted by another man at a considerable reduction. And the same force operates in a different direction. Thus, each individual maker and factor has some special "leading line," which, as an inducement to secure other business, he offers at about cost price. With one man it is chains, with another links; here brooches and there bracelets; and in turn every single branch of the trade is put through this cutting process. Consequently a cute retail buyer can, by judiciously selecting from the various stocks submitted to him, entirely stock his shop with these leading lines, thus he is enabled to mark his goods at a lower figure, and yet make a better profit than his less observant neighbours. And this thing is actually done. Talking recently with the proprietor of a prosperous country business he said, "There is not the slightest inducement for us to deal direct with the manufacturers. The factors wait upon us with their stocks, and by taking from each their cut lines only we can buy all we want much more cheaply than the makers could sell to us." This is not imagination, but fact, and it shows how widespread and how pernicious are the effects of "low prices and cut profits."

Finally, as to the remedies for this unsatisfactory condition. Our first suggestion would be, do less business. This, doubtless, appears a queer remedy for bad trade, but we can only repeat it—*do less business and make a fair profit on what you do do.* For after all what object is there in doing otherwise. A large turnover is a splendid thing provided the annual balance sheet shows a proportionate increment, but a day book, however large its total, filled with items at little better than cost is delusive and disappointing. Better by far do half the business for the same profit, thus having less expense, less anxiety, less risk, and less wear of brain and muscle. Besides, as previously noted, we quite fail to see the necessity for this constant lowering of prices. The real value of our goods is what we can get for them in the open market. The ordinary laws of supply and demand will effectively prevent us getting any undue profit from them. But it rests with us to see that we do not overstock the market. We must simply cease supplying the moment that the price obtainable falls below our limit of calculation. Under these circumstances things would speedily right themselves. Bad trade then would be simply shortness of work, and not, as now, extinction of profit, while the slightest upward tendency in general commerce would be advantageously felt to the fullest possible extent.

Secondly, the abomination of weight and fashion should be discouraged as much as possible, or rather it should be totally abolished. There is a serious fallacy underlying this method of pricing which will totally prevent it from ever being a satisfactory or just medium between buyer and seller. The fallacy is this: Weight and fashion takes cognisance of the value of the material in any article and of the actual workmanship bestowed upon it, *but it does not take any cognisance whatever of the incidental expenses of supporting a manufactory:* salaries, warehouse expenses, waste, lighting, booking, collecting, risk, and last, but not least, profit, are entirely left out of consideration by this uncouth style of jumping at the value of an article. The tendency to adopt this method is largely on the increase, and it will soon prove itself one of the most mischievous elements that the trade has ever had to deal with. It is simply a fact that no satisfactory, that is no fairly profitable, business can possibly be carried on at all on these lines. Do we need any further comment when we see nine-carat Hall-marked alberts advertised to the retailer at 39s. per ounce, *fashion included.* The shopkeepers and the public are being educated to too fine a point in these matters, to the lasting detriment of the whole trade.

Lastly, and as embodying our previous suggestions, we would recommend a straightforward and honourable combination between manufacturer and manufacturer, and between factor and factor. More mutual operations and less antagonism is what we require, and to this the trade must come before it is firmly placed on a sound and remunerative basis. There would then be no need for us to reduce our prices nor to delete our profits. We should find enough work for all, and our returns, though perhaps not so large as at present, would, unhampered by the existing drawbacks, show a satisfactory balance at the end of the year. And any surplus energy we might well devote to opening up fresh fields, both home and export, for the disposal of our goods, rather than waste it in profitless endeavours to monopolise the limits of our present trade.

Would not much of the matter indicated in this article be well worthy the attention of the Birmingham Jewellers' Association?

Manufacturer.

Birmingham, July, 1890.

Carey v. Long's Hotel (Limited).

IN the Queen's Bench Division, a case which came before Mr. Baron Pollock and a special jury last month is of such general interest that we make no apology for republishing it.

In this case Mr. Arthur Astor Carey, an American, and his wife, sued the defendants, the proprietors of Long's Hotel, in New Bond Street, to recover the value of some bank notes and jewellery which were stolen from them on December 24, 1889, while they were staying at defendants' hotel during their honeymoon. The value of the notes and jewellery was agreed at £586. They were deposited in two small boxes, which were placed in the drawer of a wardrobe in a bedroom. This drawer was unlocked; but on behalf of the plaintiffs it was said that there was no key to it. The lady's maid stated that, although there was one for the cupboard of the wardrobe, there was none for the drawer, which would not lock with the key of the cupboard. Two detectives who were called in after the robbery also said they saw no key.

For the defence, however, the manager and manageress of the hotel stated positively that two keys were supplied, one for the cupboard and another for the drawer, although the key of the former fitted the latter.

It appeared, also, that the doors of the rooms were unlocked; but plaintiffs' case was that this was in consequence of a request of the waiter, in order that he might attend to the fire.

For the defence it was said that this only applied to the sitting-room; but, in reply, it was asserted that the lock of the sitting-room door would not lock from the outside, so that when it was locked from the inside it was necessary to leave the bedroom door open in order to enter the sitting-room, as the rooms communicated. Defendants denied that the sitting-room lock was out of order. No clue was obtained of the perpetrator of the theft, and the property was never recovered. In the course of the case the plaintiff was asked whether he did not think it negligent to leave boxes containing property worth £586 in an unlocked drawer, and he admitted that he now thought it was.

Mr. C. Dodd, Q.C., and Mr. Rowlatt, appeared for the plaintiffs; and Mr. Finlay, Q.C., and Mr. Powell for the defendants.

Mr. Baron Pollock said an hotel keeper was liable for all the property of his guests that was brought into his house, unless the owner of the property had not taken "the ordinary care that a reasonable man would have taken in the circumstances." What plaintiff probably meant when he said he thought it negligent was that if he had known all he knew now, he should have thought his servant careless. That, however, did not conclude the matter, as the words given above were very cautiously framed.

The jury returned a verdict for the plaintiffs for £586. Judgment accordingly.

Meeting of Creditors.

Re Thomas Bradley.

A MEETING was held on the 9th ult. at the offices of the Official Receiver, Figtree Lane, of the creditors of William Thomas Bradley, draper and jeweller and furniture dealer, 841 and 843, Attercliffe Road, 50, Attercliffe Common, and Worksop Road, all in Sheffield. Mr. A. Neal appeared for the debtor, and Mr. Mulliner represented several Manchester firms. There was a large attendance of creditors.

The Official Receiver said the debtor, who filed his own petition, commenced business in November, 1885, with a capital of about £30. The cause of his insolvency, he said, was pressure of creditors, but, of course, that only caused him to stop. He also stated that he only became aware of his insolvency a few days before he filed his petition, but the sole reason for that was that he never took stock, and kept no books except a book in which he put down things that he had sold on credit. Several creditors had obtained judgment against him, and another point showing that he was insolvent was the fact that he had pledged some jewellery with pawnbrokers to raise money. The deficiency was more than that accounted for by the depreciation of stock and bad debts. The main cause of the debtor's stopping was that Messrs. Rylands and Co., Manchester, went and removed a lot of goods without the consent of the debtor, and when he had no goods of that kind to sell he had to stop. The statement of affairs was rather long in being prepared, but the fact was there were something like 714 debtors to the estate, and there was scarcely a debt over £5. Indeed, the great proportion of them were under £1. They consisted of things that the debtor had supplied to people on weekly payments, and the money had to be collected weekly. The debtor's unsecured creditors were £1,316 9s. 3d., and his stock, which, he said, cost him £662, produced only £345. The book debts, which he anticipated to be good, were £780, and the doubtful debts £77, making a total of £1,203 18s. 11d. On the other side the preference creditors were £9 16s. 7d., leaving £1,194 2s. 4d., or a deficiency of £122 6s. 11d. That was a very small deficiencey on such an estate, and if the goods really cost £662, that very much more than accounted for the deficiency. The debtor wanted the business to be carried on, but he did not think it advisable to do so. He then asked the debtor to inform the meeting under what circumstances Messrs. Rylands took the goods away.

The debtor, in reply, said a representative of Messrs. Rylands came to his shop when he was absent, and insisted upon taking goods worth a little under £100. What he took was mainly jewellery and furniture, but the goods they supplied were drapery. He had asked Messrs. Rylands to give them up, but they refused.

In answer to Mr. Mulliner he said in April he told a representative of Messrs. Rylands certain things, and in consequence he received goods of the value of £50. The next day some of the goods were taken away. Nine or ten days after the £100 worth of things were removed he consulted with his solicitor, and a writ for damages was issued.

Mr. Mulliner said the debtor ratified that affair by handing over himself some goods the following day.

In answer to Mr. Neal, the debtor said in consequence of Messrs. Rylands' action he was served with several writs, and one creditor got judgment against him. That was the reason why he did not proceed with his action for trespass against Messrs. Rylands, and why he filed his petition. The seizure of the £100 worth of goods became talked about, and in consequence his takings fell off about £6 or £7 a week.

The Official Receiver mentioned that the debtor was already adjudicated a bankrupt, and so far as he was concerned he should not vote for any one being trustee who represented Messrs. Rylands, because undoubtedly they had acted in a very high-handed manner, and brought about these proceedings. There were 714 debtors, chiefly for very small amounts, and if a trustee away from Sheffield was appointed he did not know how he was going to collect them.

In answer to Mr. Mulliner, he said he had proxies to vote in a certain manner, but he declined to say who it was in favour of. He did not think the creditors whose proxies were in favour of Messrs. Rylands' nominee knew that that firm had acted in such a high-handed manner, and caused Bradley to come down with a deficiency of only £120. It was a matter that would require a good deal of inquiring into.

Mr. Mulliner submitted that the Official Receiver ought to vote according to the instructions he had received, but

The Official Receiver said he should not in all cases.

Mr. Mulliner proposed on behalf of Messrs. George Lee and Son, and seconded on behalf of Messrs. Rylands, the appointment of himself as receiver.

On the vote being taken, creditors representing £269 voted for him, and others to the amount of £218 voted against. He was, therefore, elected.

The Official Receiver said a statement had been made in the House of Commons that trustees in bankruptcy worked cheaper than Official Receivers. He should, therefore, move that the remuneration of the trustee be the same as was allowed by the Board of Trade for collection, with twice the amount for distribution. He saw no objection to that. The remuneration allowed for collection was 5 per cent., and for distribution 2½ per cent., and his proposal was 5 per cent. all round.

Mr. Mulliner: Of course, I cannot vote on that.

The Official Receiver: No.

A creditor: What is the usual remuneration?

The Official Receiver: Generally 10 or 15, or even 20 per cent.

Mr. Mulliner: I beg your pardon.

The Official Receiver: I can show you cases where trustees have been allowed 15 per cent. upon the amount received, which was over £4,000, and 20 per cent. for distribution.

Mr. Mulliner: Our usual fee is 5 per cent. both ways.

Coming to the question of the committee of inspection, Mr. Mulliner suggested that Mr. George Lee, of the firm of Lee and Sons, and Mr. R. Spencer, managing director of Messrs. Rylands, should be upon it.

The Official Receiver said most certainly he should not vote for Messrs. Rylands' representative. Was it reasonable that there should be on the committee of inspection a representative of the firm who was said to have taken away these goods?

After further discussion Messrs. G. Lee, Manchester; J. H. Whiting (Messrs. Hotham and Whiting, Leeds); and W. H. Butler, 34, Wicker, were elected a committee of inspection.

The meeting then concluded.

A Southport Bankruptcy Appeal.

LAST month, in the Supreme Court of Judicature, Liverpool, Mr. Herbert Read, on behalf of Miss Minnie Beatrice Holmes, late of Fulham Road, Southport, appealed to the Master of the Rolls and Lords Justices Lindley and Bowen, from a receiving order made by Mr. Registrar Hazlitt. The order, the learned counsel said, was made on the judgment debt of £109 odd obtained against the appellant in April last, by Messrs. Batty and Son, jewellers, of Southport, for goods sold and delivered. The appellant, who is a young lady, twenty-two years of age, in receipt of about £500 a year, denied that she owed more than £59 of the debt, or that she had been served with the writ, and consequently she applied to the district registrar to set aside the judgment. The district registrar acceded to the application on the money being paid into court within three days, but the appellant was unable to comply with that order, and further time was given her. No doubt she had been led into extravagant ways, and had out-lived her income, and she was unable, at short notice, to raise the money within the time. But having presently obtained it, she applied to Mr. Justice Lawrance in chambers for liberty to bring in the amount; this, however, he refused, on the ground that it was too late. They then appealed to the Divisional Court, but the case had not yet been reached. They had offered to pay the money, but plaintiffs' solicitors had refused to accept it without an indemnity in case, under the bankruptcy laws, the amount had to be refunded. In these circumstances, appeal was made to this court for relief. The appellant was greatly averse to being made a bankrupt, and, in her extremity, was even now ready to pay the whole demand of the petitioning creditor.

The Master of the Rolls said he did not see why, if what counsel had said was true. Would she lose her income by becoming bankrupt?

Mr. Read said no, but there was undoubtedly a feeling against being made a bankrupt. He put in an affidavit showing that all the appellant's debts, exclusive of this £109, were under £320, and of this £180 was disputed as not being hers but a Mrs. Wolstenholme's, now deceased, a late friend of her mother's, in whose house appellant lived.

Mr. Cooper Willis, Q.C., appearing in the case for the petitioning creditor, denied the allegation of non-service of the writ, and put in an affidavit of service, to the effect that the lady believed to be the appellant was interviewed by the process server, and said she was Mrs. Holmes, Southport, and not Mrs. Holmes, Liverpool; she did not owe anybody any money, and would not accept the writs (of which there were three). He, however, placed them under her arm and was leaving, when she picked up the writs and threw them after him as he left the house, on which he put them in the letter-box. Mr. Cooper Willis added that they were told this lady was a widow, and that there were a lot of other creditors. The petitioners, therefore, could only accept the money under such conditions as would ensure their not having to refund it in case of proceedings by any of the other creditors.

The Master of the Rolls having, in the course of a patient investigation of the facts, read a letter from (it was understood) the appellant, which was handed to the court by respondent's counsel, but was not made public, and, showing it to Mr. Read, asked how he could press his application after that, said "We cannot interfere in the matter. This lady had better get somebody to pay her debts, and thus get rid of the bankruptcy."

The appeal was consequently dismissed.

Bankruptcy of a Jeweller in Glasgow.

THE examination in bankruptcy of Jorgan Anderson Lund, who carried on business as a jeweller for some time in Gordon Street, Glasgow, was fixed to take place on July 23—before Sheriff Guthrie—in the County Buildings, Glasgow. At the time appointed, however, bankrupt did not put in an appearance, and a warrant was granted for his apprehension. Those in attendance were Mr. John Miller, C.A., trustee; Mr. A. Weir, writer, agent in the sequestration; and Mr. Richard M'Culloch, writer, for creditors. No state of affairs was lodged.

Mr. John Waddell, in reply to questions by Mr. Weir and Mr. M'Culloch, stated that he was lately in the employment of the bankrupt as bookkeeper and salesman. He went to him in September last, and understood from Lund's own statement that he had been in business from the previous June. Lund had obtained an elaborate set of books from a stationer, but there were only a few jottings in them. There was nothing entered in the cash book. There was an attempt at recording stock, but witness had to abolish that. He could only form the very vaguest idea as to what Lund's financial position was when he went to him. He often asked for information, which he did not get, being put off with the remark that "these things would be attended to afterwards." After witness took charge of the books he wrote them up as he got instructions from Lund, and as he got opportunity. When witness knew of stock coming into or going out of the premises he always entered it. Stock could be quite easily taken out of the premises without witness's knowledge, though he entered everything he knew of. If Lund was in he received the cash, but if he was out witness received it, and always passed it through the cash-book. Lund did not always instruct him to pass through the books cash which he (Lund) received. Witness could not tell from the cash-book what accounts were still outstanding. He was aware of a good many cases in which cash was received by Lund, and was not entered in the cash-book. In one case he saw £50 paid to Lund for opal and diamond earrings. He was not aware until after the sequestration that Lund had pawned goods. He suspected this was the case, as there was an enormous difference between the stock which was going out and what was passing through the books. Lund spent most of his time outside, averring that he was busy trying to sell goods, and when he missed anything Lund told him that it was out on approbation, or that he had sold one article out of a number that he had missed, and that he would let him know as to the details afterwards. Witness never got these details, and Lund never mentioned to him what goods were sold. Witness was then questioned regarding certain transactions between Lund and a friend of his, which, he said, involved a great deal of secrecy. Lund kept two bank accounts—one with the Royal Bank, Hope Street, and the other with the Commercial Bank, St. Enoch Square. Lund occasionally mentioned to him that he had been betting on horse races. Lund left on Thursday, June 12, saying that he was going to London on business, and would be back on the following Monday. After Lund had gone away witness missed a number of goods. There was not a single gold albert left in the place, and there had been at least a dozen. He also missed a chronometer watch, half-a-dozen gold watches, and some diamond goods. The watches had disappeared one by one previously. He wrote to Lund in London the same night about the missing articles. He got a reply which contained no reference to his remarks. For days before that the stock had been disappearing, and witness got no account from Lund as to what he was doing with it. Witness latterly suspected that Lund was pawning the goods. Witness believed that some of the diamond goods that were taken away were on approbation. In his knowledge Lund instructed two sales by auction in Glasgow and two in Edinburgh. The auctioneers had all settled with Lund. Each sale was catalogued and a careful record kept. Whatever was sold was afterwards entered in the day-book, and the balance was returned. One or two approbation goods were sent to these sales, but the bulk of the articles were stock goods. In some cases the goods were sold under cost value, but the bulk of them realised more than cost. Lund had taken away certain tools which would be very handy if he went into a situation or started business again. He had had no word from the bankrupt since he went away, and had not the faintest idea where he was. He had been told by one man, but it seemed to be in joke, that he had gone to South America.

Mr. Julius Loewenthal, who was next examined, said he was a general dealer. It did not matter what he dealt in—jewellery, cigars, or anything that came his way. His place of business was where he resided, 200, St. George's Road. He knew Lund first when the latter was with Edwards and Sons, and had transactions with him about six months after he started business. The nature of their first transaction was that Lund applied to him to get money for him. There was no security offered. Witness had to pawn goods for Lund. He went to Lund's place of business and got different things to pawn. He got diamond rings, brooches, bracelets, etc. The things he could not carry away himself were sent to his house. There would be as much as £200 worth at a time. Witness pawned the articles in his own name, the reason being that Lund did not wish his name in it, and witness said to him, "It does not matter." He gave all the tickets and cash up to Lund.

Were you doing this as a friend for Mr. Lund?—No, he was not a particular friend of mine. I might have had some little inducement. I did it for remuneration.

Did you hand back the whole money?—Yes.

What about your remuneration?—I got none. He always put me off from time to time, saying he was hard-up. Sometimes he handed the cash over to the manager without saying where it came from. When witness handed the money to Lund's manager he (witness) said nothing. Lund told him to hand the money to the manager. He got no acknowledgment from the manager or from Lund. Witness handed the tickets to Lund, because the latter did not wish his manager to know of these transactions. Lund did not get any tickets from witness within the last four or five months. Before that he handed all the tickets to him. The pawning transactions had been going on about a year.

How much in value will you have pawned?—I should say about £3,000 worth in tickets. Very little had been uplifted. Witness was aware that Lund was not long in business, but that was not his business.

Did you retain no cash out of the proceeds?—No. I handed up cash and tickets as I got them. Latterly I told him I could not stand this any longer, and must retain the tickets for my remuneration. These tickets were at his house.

Are you willing to deliver up the tickets to the trustee?—Certainly, if I get a back-line from the trustee that I will get my remuneration.

How much is your remuneration?—It is a certain sum. My account is not made up.

Was there nothing fixed between you and Lund?—Yes; 10 per cent. He would give up the tickets on the usual footing—that he got in the sequestration any preference to which he was legally entitled. He had not bought any goods from Lund.

Have you two discharged accounts embracing the greater portion of these articles?—Yes.

What is the meaning of that?—I suppose if the trustee has any claim against me he knows where to find me.

Did you produce these accounts as being settled to the trustee in answer to his claim?—Yes.

Did you pay any money when you got these two accounts discharged?—No. I took these discharged accounts for the purpose—I found—I said, "It is impossible you can carry on in this way, and most likely you are entering these things in your book in my name." He assured me that he was not, but I said I must have some satisfaction. My reason was probably to secure myself, because I knew from the state the man was in he would do anything. He was not aware of any of the goods being held on approbation.

Had you any betting transactions with Lund?—I might have had a betting transaction, but not as a rule.

Were there any heavy sums passed between him and you either as principal or agent?—No, none.

This closed the examination of Mr. Loewenthal.

The further proceedings in the sequestration were adjourned.

A Famous French Jeweller.

THE following short but interesting article on Tavernier is from the *Keystone*:—

Our age has no jewellers of the kind of which the French traveller, Tavernier, was a seventeenth century example. He was really a pedlar, but of such a high grade that he rather over-topped the regulars. Then he combined business and literature, writing a book of travels that has outlived him a couple of centuries, and which in our day is deemed worthy of a new edition and a distinguished editor. He began business early, having visited many parts of Europe by the time he was fifteen years old. He often carried a value of gems varying from 100,000 dols. to 300,000 dols., and he sought for the cream of the trade of his time—that is, kings, princes, etc. They had most of the cash of that day, and they bought prodigally—though they didn't always pay up satisfactorily. It cost something, too, to do business with such customers, access to them having often to be bought through costly gifts to court functionaries and servants who barred the way to royalty. Tavernier somewhat resembled modern jewellers in not proclaiming his profits from the housetops, but as he sometimes had to pay out in preliminary gifts 20,000 dols. to 30,000 dols. it is probable that when he did reach his princely customers he made them come down with the dust in remunerative quantities. It was necessary sometimes to secure the good-will of the ruler himself before the potentate would look at things from the right point of view. In consideration of the profits he expected to get out of the Great Mogul, for example, Tavernier deemed it wise to present that customer with some costly specimens of the highest art French silverware of his day. He sometimes encountered court officers who desired to buy his jewels, and themselves sell them to their master, and this sort of opposition cost him 10,000 rupees once in a case where he desired to reach the Sultan. It is evident that the jewellery business of the "good old times"—even such a select branch of it as Tavernier followed—had its troubles, though not the same as are now complained of. Louis XIV. was a patron of Tavernier's, and conferred on him the title of Baron of Aubonne—probably in part payment for jewels sold at a "cut rate." Our traveller was out on the road when his life ended, being headed for Moscow—and a trade with the Czar, probably, when he was "called in."

The Gordon-Orr Diamond.

WE congratulate, says the *Evening Standard*, the former owners of the Gordon-Orr diamond. They have had it a long time on hand, eating its head off in current expenses—assurance, cost of protection, agents' charges, commissions, and an indefinite array of extras, not to speak of the anxieties and hopes deferred which cannot be reckoned in a balance-sheet. At length there is an item on the other side which enables them to write off the transaction. The Nizam of Hyderabad has bought their treasure, and it will receive the honour long due at last, when fixed in His Highness's puggaree. The sum paid is 165,000 rupees—say, £12,375; but, too probably, we must reduce it by a couple of thousands to meet claims unavowed, but substantial enough, which fall under the head of Secret Service. It would be curious to see the actual balance-sheet of the late proprietors. We can fancy the joy of the original discoverers when they turned it up at "Old de Beers"—the "best, purest, and most brilliant gem known to connoisseurs," as their friends at least declare, weighing 67½ carats. That balance-sheet might display a positive loss, we suspect; and in the best case it is tolerably certain that a stone of half the size, sold without expense or difficulty, would have been more profitable when accounts are made up. There is hardly a sale for such big diamonds at present, and those who know what is going on wonder sometimes how long the demand of ten-carat stones will keep up. We hope those good fellows who found the "Gordon-Orr" had the shrewdness to sell it for what they could get on the spot. The "diamond-kooper" needs no sympathy.

The Mineral Wealth of South Africa.

MANGANESE ore occurs on the ranges of the Cape Peninsula and Drakenstein Mountains. Near Du Toit's Kloof, about thirty miles from Cape Town, a mine has been opened and worked by a private company; the ore is plentiful and rich, yielding from 70 to 90 per cent. Garnets, both red and green, are found in the north-western portion of the colony. They are abundant at the Diamond Mines as coarse fragments, but at the River diggings there are rounded forms of a ruby colour. Agates are found of many colours and shades. In the Vaal River they are so ground down and polished as scarcely to require any further polishing. In the Orange River also they are numerous and handsome. Crocidolite, an asbestiform mineral, occurs in Griqualand West. This is commonly confounded with asbestos, which is, however, quite a distinct species. The crocidolite usually occurs between the bedding plains of jasper, in layers of one to three inches in thickness, and of dark bluish colour. The pseudo-crocidolite is a handsome ornamental stone found in Griqualand West, and also south of the Orange River. It is a species of fibrous quartz that displays a distinct ray of light down the centre when properly cut. The quartz minerals are well represented—they are cairngorms, quartz crystal, amethyst, rose quartz, red and yellow jaspers, and striped and clouded jaspers. Chalcedony is very abundant along the courses of the Orange and Vaal Rivers. Bloodstone is also found in the Orange River. Ores of iron are found widely distributed throughout the Transvaal. Little has yet been done in turning these ores to any practical account, but the natives are skilful in extracting the metal for battle-axes, assegais, and other weapons. Lead is met with throughout the Transvaal, and the ore is generally found to contain more than the ordinary proportion of silver. In the district of Marico the galena in found so very near the surface that, instead of making shafts, the hills where the ore is found are cut down bodily, and many enormous blocks of the ore are unearthed. The proportion of silver to lead in the galena is very rich, varying from 29 ozs. to 93 ozs. per ton; but the average is said to be very high, viz., 63 ozs. per ton, and to increase according to the depth from which the ore is taken. The daily average of lead ore formerly produced at the mines was between 3,000 and 4,000 lbs., although in one day the output reached the maximum of 10,000 lbs. Transport difficulties stood in the way of export, and when arms ceased to be supplied to the natives, the local consumption also ceased, and the mine was closed. In the Middleburg district there is a cobalt mine, but the demand for this mineral is so limited, and the market value so low, that it does not pay expenses of export. Gold in quantities large or small occurs in widely distant portions of South Africa. A great belt of auriferous country, varying both in width and in richness, stretches right across the continent north of the Orange River, from Delagoa Bay to Walfish Bay, while reefs and alluvial deposits are likewise found so far south as Kuysna and in the Cape Peninsula. Serious attempts to turn this mineral wealth to account date back but little more than twenty years, although its existence has formed part of the traditions of the country for centuries past. So far back as 1845, L. von Buch, the German geologist, declared that there was a wonderful resemblance between the geological formation of South Africa and that of Australia, and of the metalliferous strata of the two lands. The value of gold exported through the Cape Colony and Natal amounted in 1888 to £908,694, while for the first ten months of 1889 it amounted to £1,093,084. This amount only represents that portion of gold brought up and exported by banking and mercantile establishments, but does not include a considerable amount exported by private persons, nor the value of what is exported through Delagoa Bay. The value of the diamonds produced in the diamond mines of Griqualand West during the year 1887 amounted to £4,251,670, and in 1888 to £3,608,218.

The Mexican Pearl Fisheries.

THE pearl fisheries of Mexico are about to be prosecuted with greater energy, and the Government has just granted a concession for fifteen years to Señor Quaglia for the exclusive right to fish for pearls in the Gulf of California and off the coasts of Lower California. Hitherto the average annual value of Mexican pearls sent to Europe has been about 80,000 piastres, and of mother-of-pearl about 25,000 piastres. The divers (mostly Sonora Indians) are remunerated according to results, and there is a wide margin between the prices fetched on the spot and those obtained in Europe; for instance, a pearl which is bought in La Paz for 500 dollars will fetch about 25,000 francs in Paris. Mother-of-pearl shells, again, which may be bought in La Paz at from eight to twelve centavos per lb. are worth three times as much in Europe. Mexican pearls take the next place after the Indian for beauty; they are mostly small and irregular in shape, but very hard, and of exceptional brilliancy. In the year 1881 a pearl was found weighing 28 carats, and this fetched 90,000 francs in Paris; in 1883, again, one of the divers brought up two pearls, weighing together 76 carats. Mexican pearls are mostly white, and these are of less value than the brown, black, or pink, the latter being the rarest. The finest specimen has been set in the Spanish royal crown; it weighs 100 carats, and although it dates from the seventeenth century, it still preserves its ancient brilliancy. The pearl fishery is a very lucrative business in Mexico; the oyster shells brought up sell at the rate of ten to twelve piastres per 100 kilogrammes, which of itself is sufficient to cover all expenses, everything else being clear profit.

The Burmah Ruby Mines.

GREAT expectations have no marketable value—a fact which, according to a contemporary, the shareholders in the ruby mines of Burmah will be wise to remember. The first year's experience has not fulfilled the hopes which were justifiably entertained of those mysterious depths from which for ages past the Lord of Many Elephants had filled his treasure jars with precious stones, but, on the other hand, it appears from Sir Lepel Griffin's statement to the shareholders, reported yesterday, that among those brought to earth is perhaps the largest ruby which has ever been handled. This gem, it appears, weighed three hundred carats. There may be bigger ones in some private collections not open to the mineralogist, but this stone may provisionally claim to be the greatest at present out of the soil. Unfortunately, a ruby requires to have other merits besides weight, and the latest Burmah find is admitted by its best friend not to possess the value which can be assessed in current coin of the realm. However, it is the embodiment of hope, and as gem-hunting is even more of a fight with fortune than gold-working, there is no reason for doubting but that at any moment the waiting men, to whom all things are said to come, may, like Marlowe's Moor, pick out of "the Eastern rocks" the precious gems as thick as "pebble stones." It is impossible to say what Burmah has in store. King Theebaw (when sober) used to treat favoured visitors with the sight of great chatties, heaped with the product of his mines. He permitted them to dip their arms into the vessels, but his thrifty Majesty took uncommonly good care that nothing stuck to their palms. Most of these treasures were either taken away by the King, or stolen in the confusion attending his dethronement; and as they have still to be disposed of, the dealers are making their calculations accordingly. And into the market they must eventually come. Nothing in the world is so indestructible as a precious stone. Time scarcely affects its surface, and its size is so insignificant that without trouble it may be concealed and carried about, and even swallowed on an emergency. Unlike gold and silver, it is never worn away, or converted into currency, or beaten into the semblance of things in heaven or upon earth. Thus, a first-class ruby or diamond is about the nearest representative of an unchangeable object that it is possible to find in a world where, to borrow the words of Pliny, nothing is certain except that everything is uncertain.

There is really no reason for doubting but that some of the rubies in the shop-windows of Regent Street may be the identical stones which flashed in the tiaras of queens a thousand years ago, or imparted glory to the diadems of kings. The ring bought in London last week may be set with the same ruby, "worth a hundred ducats," which, as "the loyal serviteur" tells us, the Chevalier Bayard won at the tourney of Carignan. Or, it is quite open to believe that among the jewels into which the wife of the American millionaire has converted part of his quickly-acquired wealth is that "ryng of gold with a rubye the value of a thousand scuttes," which Henry VII. offered to the knight who "juisted best in the justys roiall," four hundred years ago. The gold has long since vanished; but the stone is everlasting. What has come of the sparkling gems which the conquerors of the world hoarded in Rome or in Byzantium? They cannot all have perished in fire, or have been crushed under foot, or lie buried in the ruins of great cities. They who, according to a wonderful tale in the "Gesta Romanorum," "rayled in the roofe with rubyes ryche," must have possessed many more than have been identified in the jewel-houses of Europe, or have been disinterred amid the sands of Africa on the sites of fair towns and graceful temples. It is true that it does not do to place too much dependence on the stories of mediæval travellers. For even Marco Polo, now that Colonel Yule is no longer here to defend him, may be doubted when he tells us how in Ceylon the King of his day had a ruby so fine that the Great Khan offered a city in exchange for it. Yet a host of other writers of a subsequent date are equally positive regarding this gem. Friar Jordanus describes one in this sovereign's possession so large that when grasped in the hand it projected a finger's breadth at either side, and Andrea Corsali, writing in 1515, is almost as enthusiastic over two rubies which he saw in the Cinghalese sovereign's palace. Ibn Batutah, that earliest and most entertaining of Moorish vagabonds, affirms that he was shown in the house of Arya Chakravasti, a Tamil chief ruling at Pathan, "a ruby bowl as big as the palm of one hand;" and to come to times more tangible, one the size of a pigeon's egg was owned by the ex-King of Burmah. These, if they could be authenticated, might, in size alone, run pretty closely the stone referred to by Sir Lepel Griffin. Chardin, indeed, described one which he saw in Persia, engraved with the name of Sheik Sephi, which must have been quite as big, though he does not give its weight; and Tavernier, an old traveller, and dealer in such goods, gives a drawing of another without crack or blemish, which weighed one hundred and seventy-five carats, and is, no doubt, still cherished by the Shah. The largest ever seen in Europe was that presented by Gustavus III. of Sweden to the Czarina. It is of the bulk of a hen's egg, and of fine colour, exceeding even in size the uncut gem which, on his last visit to William III., Peter the Great pushed into the King's hand, wrapped in a bit of brown paper. There used to be another fine one among the French Crown Jewels, as an adornment of the insignia of the Golden Fleece, and, as it was cut into the form of a dragon, it was preserved as a triumph of art when the Republic disposed of most of its fellow gauds by auction. But perhaps the largest ruby of which any accurate knowledge has been obtained is that found during the sack of the Summer Palace at Pekin. It was carved into the image of a Buddha, and purchased on the return of the expedition by "the famous Duke of Brunswick," but, on his death, was sold for the insignificant sum of six hundred pounds, owing, we believe, to the inferior character of the stone.

It is justifiable to expect quite as notable finds in the future as have been unearthed in the past. For there is no ground for holding that the best gems are on the surface, or that, with modern machinery such as has enabled South Africa to discover more diamonds than the world ever owned before, the deeper deposits of Burmah, India, and Ceylon, not to speak of others still unsuspected, may not be proved to hold in store stones as wonderful as those foot-long rubies with which—the veracious Sir John Maundevile assures us—"the Emperor lighted all his chambers at night." Corundum, the poor relation of the precious ruby and sapphire, is of wide distribution. Nineteen years ago a great quantity was found in Macon County, in North Carolina. Some pieces were fine enough to be cut into gems, though, like that discovered in New Jersey, Montana, New Mexico, Arizona, and Colorado, very little of it was of such a colour as would entitle this mineral to be designated by the name of ruby. Indeed, the best discovered was not worth more than twenty pounds. Australia has also yielded true rubies, but none of them of great value or of unusual size. Indeed, though size has a great deal to do with worth, it is seldom that a true ruby is of huge dimensions, and, at the same time, of fine colour and without flaw. Most of the gems are like the one set in the Maltese Cross in front of the State Crown of Great Britain, and which is, in reality, a mere spinel. A true Oriental ruby, with the right colour, and all the virtues attaching to so precious a stone, is, if weighing five carats, worth ten times as much as a diamond of equal weight. Accordingly, the imitation article, composed of silicate of alumina, coloured with oxide of chromium, is a stone against which the inexpert traveller has to be on his guard, especially in Colombo and Mandalay, little consignments being yearly sent from Paris to the guileless dealers in more remote cities. The Burmese Mines—at Kyat Pyen, seventy miles north-east of Mandalay, at Mookoop, a little further to the north, and in the Sagyin Hills, about fifteen or sixteen miles from the capital—are, however, the great sources not only of the ruby but of the sapphire and other precious stones associated with it in the gemniferous gravel. These have hitherto been washed in the most primitive manner, and it is doubtful whether even the Kings of Burmah, who, until our annexation of the country, seized all stones over a certain weight, were put into possession of the best. Nor is it at all likely that the acquired knavery of the "hereditary miner" will cease to be exerted against the new owners. Indeed, it seems as if the native gem seeker has, on the whole, been rather more successful than the foreign one. For he knows the ground. He is proof against the climate. He lives on little, and is indifferent to machinery and the latest appliances of science. And, above all, the hereditary miner is not hampered by any conscientious scruples—which fact goes a very long way in the East.

Diamonds.

THE diamond mania which has possessed leaders of London society this season, says the *Glasgow Herald*, has surely reached the climax. The precious stones have been worn in various eccentric modes at recent entertainments—for instance, in the form of small fish with aquamarine eyes placed with tails erect by way of epaulettes, while from the mouths a waterfall of diamonds was spouted over the wearer's beautiful arms. The same dress, a pale river green satin, was veiled in cloudy white muslin, over which diamonds were scattered broadcast with lavish hand. Jewelled serpents with diamond eyes twined about the bodice, and reared themselves on the shoulders of one of the favourite dresses of the beautiful Duchess of Leinster, while diamond birds poised as if ready to fly on the shoulders of a pale pink satin gown worn by the same lovely lady. These novel epaulettes are connected by a chain of diamonds festooned across the bodice, a fashion much affected by owners of several superfluous diamond necklaces. Glittering showers of diamonds fell from the beak of each bird on the bare arms. Coronets, tiaras, and double necklaces of diamonds have been worn by dowagers and young matrons at some of the brilliant entertainments of a brilliant season.

The very low and almost sleeveless bodices which still hold their own allow ample space for the display of jewels. Colours have also been chosen with a view to showing off jewels, dog-rose pink having been specially popular for this season. Poplar-green, yellow, grey, and delicate shades of mauve have been greatly worn, though white satin has been as much in the ascendant for both *debutantes* and young matrons as it was last season. The diaphanous materials once considered the only wear for dames have been discarded in favour of more substantial, and therefore in the end more economical, material, such as brocade, thick satin, and faille. Such dresses are made with short trains, and skirts which wane scantier as the bodices wax ampler, the latter allowing space at least for a waist of ordinary proportions, while the former hardly leave sufficient room for one thin silk petticoat. Brocade dresses are frequently worn with bodices of coloured silk muslin.

New Quicksilver Mines.—An important discovery of cinnabar deposits has been made at the village of Kurusz, in the district of Dagrestan in Poland. The ore assays 74·7 per cent. of mercury. Preparations are being made to work those deposits at once.

The Metallurgical Arts at the Paris Exhibition.

Read before the Members of the Franklin Institute
by F. Lynwood Garrison, Delegate of the
Franklin Institute.

(Concluded from page 21.)

CONCLUDING that part of the subject of more immediate interest to our readers, Mr. Garrison says:—In the very important matter of corrodibility, it is with the greatest satisfaction I can state that the steels rich in nickel are practically non-corrodible, and that those poor in nickel are much better than other steels in this respect. Thus, some experiments we have made show that, as compared with mild steel of 0.18 carbon, five per cent. nickel steel corrodes in the ratio of 10 to 12, and, as compared with steel having 0·40 carbon, with 1·6 chromium, in that of 10 to 15. In the case of twenty-five per cent. nickel steel, these ratios are as 10 is to 870, and ten to 1,160, respectively. These results were obtained by immersion of samples of the different steels in Abel's corrosive liquid, and the results confirmed by subsequent immersion in water acidified by hydrochloric acid. Some samples of the richer nickel steels which have been lying exposed to the atmosphere for several weeks still show an untarnished fracture.

The alloys up to five per cent. of nickel can be machined with moderate ease; beyond that strength they are more difficult to machine. The poorer ones stand punching exceedingly well, both as rolled and after annealing. The punch-holes can be put as close together as one-eighth inch without the metal showing any signs of cracking.

The one per cent. nickel steel welds fairly well, but this quality deteriorates with each addition of nickel.

The poorer alloys do not show any lustre, but the richer ones have a lustrous appearance when the scale is removed.

I do not think I have anything more to add as to the properties and qualities of these alloys, but it may be interesting to state the theory held by the inventors regarding their formation. They state that they adopt M. Chernoff's view of steel—that it is composed of crystals of metallic iron, cemented together by carbide of iron; and they account for the extra strength given to steel by nickel by its alloying with this carbide of iron to form a stronger cement that the space between the crystals of iron is thus more completely filled, and the cohesion between them rendered much more powerful; that the points of solidification of the cement and crystals are nearer, producing or maintaining a more intimate interweaving of the elements; that their process of manufacture is necessary to cause the nickel to enter into combination and produce a homogeneous alloy, as without it there would only be formed a mechanical mixture, not possessing homogeneity, malleability, or ductility.

Icelandic Jewellery.—There was an exhibition and sale the other day in an artist's studio of some wonderful Icelandic belts, clasps, etc., presided over by the wife of a Cambridge professor, who is herself a native of the land of geysers, and who wore the picturesque national dress. She considers that her countrywomen are under-educated, and is most anxious to provide them with the benefits and blessings of the high-school system. Someone has given her a bit of land at Reykjavik, and she has had the house built, but the sinews of war are needed for its staff and furniture, and these, it is hoped, may be provided by the sale of silverware and ornaments. There were some old apostle spoons that made one's mouth water, to say nothing of drinking cups and chains and clasps. The most interesting thing to my (*Morning Post's* correspondent) mind is the fact that all are, to a certain extent, amateur work, they were made in past generations, and have been handed down from father to son and from mother to daughter, as there are no jewellers in Iceland.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

9,334. C. Bachen, London, for "Improvements in bracelets." Dated June 17, 1890.

9,482. R. A. Sloan, Liverpool, for "Improvements in and relating to watch glasses." Dated June 19, 1890.

9,680. J. P. Bayly, a communication from H. Bennett, United States, for "An improved watchman's time recorder." Dated June 21, 1890.

9,743. W. Pearce and S. C. Scott, Birmingham, for "Improvement in solitaire and other similar fastenings." Dated June 24, 1890.

9,748. H. J. Allison, a communication from Courvoisier Wilcox Manufacturing Company, United States, for "Improvements in watch case springs." Dated June 24, 1890.

G. H. Hooper, London, for "Improvements in winding mechanism for keyless watches and the like." Dated June 25, 1890.

M. G. Hayles, London, for "An improved brooch fastening." Dated June 27, 1890.

10,280. C. W. Weisbarth, Truro, for "An improvement in a tool for taking joint pins out of jewellery, making fasteners to hold or to keep the stones in jewellery and piercing holes." Dated July 3, 1890.

10,340. W. Townsend, London, for "A new or improved regulative stud or dress fastening. Dated July 4, 1890.

10,435. W. P. Thompson, Liverpool, a communication from L. M. Marckwald, Germany, for "Improvements in watch or clock escapements." (Complete specification.) Dated July 5, 1890.

10,671. M. Benjamin and J. Hardy, London, for "Improvements in the movements of watches and other timepieces." (Complete specification.) Dated July 9, 1890.

10,715. W. Clark, London, for "An improved spring fastener applicable for brooches and other purposes." Dated July 10, 1890.

10,839. J. P. Bayly, a communication from J. Mathewson, United States, for "An improved bracelet." Dated July 12, 1890.

10,921. C. R. Webster, London, for "A new or improved apparatus to be used in silversmiths' work. (Complete specification.) Dated July 14, 1890.

11,031. J. Makin, London, for "Improvements in fastenings for brooches, sleeve-links, and other similar articles." Dated July 15, 1890.

11,086. H. Robottom, Birmingham, for "Improvements in keyless mechanism for watches." Dated July 16, 1890.

11,301. J. D. Jones, H. A. Shillam, and H. Dawson, London, for "Improvements in studs, solitaires, and other similar articles." Dated July 19, 1890.

Recent American Patents.

Apparatus for Testing Watch Balances. W. D. Olney	429,699
Bracelet. J. R. Mathewson	430,295
Buttoner. J. M. Sullivan	429,661
Cane or Umbrella Handle. A. Kronse. (Design)	19,900
Chain. P. Thomas and L. S. Beals	429,978
Clasp. N. Eiseman. (Design)	19,897
Combination Tool. F. J. Herrick. (Design)	19,913
Engraving Machine. J. C. Palmerlee	430,542
Exhibition Tray. H. K. Dyer	430,842
Frame for Sight-testing Spectacles. J. K. Underwood	430,763
Jewellers' Furnace. B. Rein	430,196
Match Box. H. P. Fairchild. (Design)	19,894
Match Box. H. W. Fairchild. (Design)	19,910
Process of applying Lines and Characters to Watch Dials. W. S. Eaton	430,424
Repeating Watch. A. W. Matthael	430,739
Repeating Watch. C. Ruhnke	430,692
Sample Holder or Fastener for Show and other Cases. G. W. McGill	429,943
Scarfpin. Jos. Well	430,903
Stem Winding and Setting Mechanism. C. V. Woerd	430,099
Tablet Attachment for the Frames of Purses. L. B. Prahar	430,351
Watch Case Spring. T. K. Benton	430,824

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

Davis, Richard Perkin, 20, Church Street, Lozells, and 169½, Hockley Hill, Birmingham, silversmith and jeweller.

Creditors.		£	s.	d.
Robinson, Sabina	Birmingham	360	5	0
Allen, J.	,,	10	5	0
Boston, T., and Son	,,	12	8	0
Evans, R. C.	,,	10	13	0
Fully-secured Creditor.				
Gottwalter, W. G.	Birmingham	10	0	0
Preferential Creditors		10	0	0

Total Estimated Debts—£430.

Hook, John James, Market Place, Midsomer Norton, watchmaker and jeweller.

Creditors.		£	s.	d.
Lawson and Ward	London	10	17	3
Snelling, E. A.	,,	16	5	8
Milleret and Co.	,,	16	13	0
Jacobi and Co.	,,	10	17	9
Birmingham and General Loan and Deposit Co., Limited	Birmingham	32	19	3
Evans and Brown	,,	18	2	3
Hook, W. G.	Bridgwater	116	8	0
Platnaeur Bros.	Bristol	39	15	11
Veale, —	,,	33	0	0
Liabilities		361	4	6
Assets		110	10	6

Vassalli, James Anthony, 32, St. Nicholas Street, Scarborough, jeweller.

Creditors.		£	s.	d.
Carley, G., and Co.	London	10	18	10
Grimshaw and Baxter	,,	10	0	0
Klean, M., and Co.	,,	15	15	2
Stauffer, Son, and Co.	,,	41	19	0
Wellby, D. and I.	,,	18	16	0
Griffiths, H., and Son	Birmingham	57	0	0
Jones, H., and Co.	,,	17	14	0
Woodridge, Lister	,,	82	9	0
Boam, B.	Brighton	179	0	0
Newsome and Co.	Coventry	27	11	6
Marlow, C. J. H.	,,	16	0	0
Chadwick Bros.	Scarborough	10	0	0
Hart, T.	,,	36	0	0
Hart, John	,,	10	0	0
Woodall, —	,,	30	0	0
*York City and County Banking Co.	,,	675	0	0
Hutton and Sons	Sheffield	16	0	0
Walker and Hall	,,	16	2	7
Partly-secured Creditor.				
Dawson, John Miles (Estimated value of security, £2,800.)	Tadcaster	4,100	0	0
Preferential Creditors.				
Parnell, Thomas	Scarborough	17	15	8
Seeley, A.		17	0	0
*York City and County Banking Co.		375	0	0

STATEMENT OF AFFAIRS.

	£	s.	d.
Liabilities	2,777	15	10
Assets	433	14	3
Less for Preferential Claims	316	15	6
	116	18	9
Deficiency	2,660	17	1
	£2,777	15	10

Kurman, Israel Moses, 365, Commercial Road, 106, Barking Road, and 52, Rye Lane, Peckham, London, watch jobber and jeweller.

Creditors.		£	s.	d.
Barnett, —	London	79	16	2
Falck and Levy	,,	116	6	3
Hyman and Abraham	,,	10	0	0
Messer, —	,,	127	9	0
Nordman, J.	,,	53	7	0
Watchman and Cardox	,,	37	0	0
Smith, J., and Co.	Birmingham	18	14	11
Thorneywork, —	,,	10	0	0
Partly-secured Creditors.				
London, S. (Estimated value of security, nil.)	London	56	0	0
*London and South-Western Bank (Estimated value of security, £20.)	,,	33	0	0
Mutual Loan Fund Association (Estimated value of security, £13 15s.)	,,	13	15	0
Preferential Creditors		20	12	2

STATEMENT OF AFFAIRS.

	£	s.	d.	£	s.	d.
Liabilities.						
Unsecured creditors				393	11	11
Partly-secured creditors	£102	15	0			
Estimated value of securities	33	15	0	69	0	0
				462	11	11
Assets.						
Stock-in-trade	£80	0	0	40	0	0
Trade fixtures, fittings, etc.	160	0	0	13	0	0
Book debts: Good				28	5	5
Doubtful	7	10	0			
Bad	257	6	9			
	£264	16	9	5	0	0
				86	5	5
Less for Preferential Claims				20	12	2
				65	13	3
Deficiency				396	18	8
				462	11	11

WARWICK.

Cohen, Abraham, 121, Balsall Heath Road and Bromsgrove Street, Birmingham, jeweller and factor. Trustee, Thomas Kinder, Chapel Fields, Coventry, watch manufacturer, and another, with a committee of inspection. Unsecured Liabilities, £1,216 4s. 3d. Estimated Net Assets, £964 8s. 9d. Creditors fully secured, £155. Deed of Composition dated June 27, 1890; filed July 4, 1890.

Creditors.		£	s.	d.
Griffith, H., and Son	Birmingham	75	0	0
Lea, Henry	„	14	0	0
Spencer and Son	„	11	10	0
East and Smith	„	30	0	0
Hopkins, E., and Co.	Coventry	117	11	7
Read, A. H.	„	144	4	0
Kinder, Thomas	„	319	17	6
Richardson, James	„	53	0	0
Newsome and Co.	„	70	0	0
Craig Bros.	Glasgow	144	3	10
Brayshaw, B. E., and Co.	Leeds	84	3	6
Marshall, J., Son, and Co.	„	49	13	3
Robertshaw, A., and Son	Manchester	19	11	3

LANCASHIRE.

Rogers, William, 11, Cook Street, Liverpool, Barkfield House, Freshfield, near Formby, watch and clock maker. Trustee. R. Bushell, 3, Castle Street, Liverpool, wine merchant, and others. Unsecured Liabilities, £4,465 13s. 9d. Estimated Net Assets, £2,576 5s. 8d. Creditors fully secured, £35 18s. 2d. Deed of Composition dated June 20, 1890; filed June 27, 1890. Deed of Inspectorship and Assignment of Debtor's real and personal estate for benefit of creditors.

Creditors.		£	s.	d.
Bourne and Co.	London	211	0	0
Bendon, George, and Co.	„	53	0	0
Gay, E., Lamaille, and Co.	„	14	0	0
Klean, M., and Co.	„	152	0	0
Smith and Sons	„	209	0	0
Weill and Co.	„	35	0	0
Carley, George, and Co.	„	103	0	0
Borton and Styles	Birmingham	110	0	0
Friedlander and Co.	Coventry	17	0	0
White, Joseph	„	124	0	0
Young, Mrs.	Formby	73	0	0
Kimmer, E.	„	70	0	0
Hewa, Dr.	„	40	0	0
Spencer, W.	„	11	0	0
Nicholls, H. J.	Liverpool	17	0	0
Russell, Thomas. and Son	„	15	0	0
Bushell, Reginald	„	620	0	0
Beecham, G. C.	„	206	0	0
Clarke, J. B.	„	205	0	0
MacAdams, Mrs. Emma	„	202	0	0
Parr's Banking Co.	„	35	0	0
Union Building Co.	„	242	0	0
Corporation of Liverpool	„	10	0	0
Browu, Alexander	„	21	0	0
Abram Coal Co.	„	20	0	0
Johnson, J. H.	Southport	1,037	0	0
Boothroyd and Co.	„	10	0	0
Brown, Joseph	Waterloo	545	0	0

Siddown, John William, late of Studley Terrace, New Bank Road. Blackburn, now of Coalville, jeweller and general dealer. Trustee, Joseph Howley, 44. New Bank Road. Blackburn, jeweller and general dealer. Unsecured Liabilities, £125 19s. 4d. Estimated Net Assets, £131 10s. 6d. Deed of Composition dated June 20, 1890; filed June 25, 1890.

Creditors.		£	s.	d.
Smalley and Briggs	Wigan	67	5	0
Murdock, J. G., and Co., Limited	London	56	4	4

WARWICK AND STAFFS.

Skinner, George (and trustees), 87, High Street, and 62, Varna Road, Birmingham, lately of "Dalrymple." Wellington Road, Harborne, jeweller. Trustee, E. M. Sharp, 120. Colmore Row. Birmingham. C.A., with a committee of inspection. Unsecured Liabilities, £4.721 9s. 9d. Estimated Net Assets, £1,772 5s. 6d. Creditors fully secured, £2 2s. 6d. Deed of Inspectorship and Composition supplemental to a Deed of Assignment dated January 1, 1890, and filed January 7, 1890. The present deed provides for the payment of a composition of 9s. 6d. in the £, payable 2s. at six months, 1s. 6d. at nine months, 2s. at twelve months, 2s. at fifteen months. and 2s. at eighteen months. from January 2, 1890, the first and last instalments secured by sureties, and the whole further secured by assignment to the present trustee (one creditor agreeing to postpone his claim until the other creditors have received the said composition). Deed of Composition dated June 30, 1890; filed July 7, 1890.

Creditors.		£	s.	d.
Backes and Strauss	London	127	7	6
Gray, —	„	15	0	0
Gourdel, Vales, and Co.	„	17	2	11
Little, James, and Co.	„	54	2	0
Miller Bros.	„	17	19	11
Monjon, Manger, and Co.	„	38	18	0
Pritchard, W., R., and Co.	„	27	15	10
Stauffer, Son, and Co.	„	80	19	0
Abrahall, M. J.	Birmingham	40	15	9
Allen and Martin	„	32	1	6
Butler, A.	„	10	4	5
Baker and Hinks	„	39	5	10
Barker Bros.	Birmingham	13	16	6
Booth and Sons	„	16	0	3
Birmingham and Midland Bank, Limited	„	730	7	5
Clewley, E. J., and Co.	„	19	3	10
Dawson, G. W.	„	15	2	10
Dingley, A.	„	56	18	9
Eames and Co.	„	88	15	11
Evans and Brown	„	56	1	0
Goldsmid, M. J.	„	180	0	0
Hinde Bros.	„	41	19	6
Hughes, T. and J.	„	10	0	0
Lyons, —	„	30	4	0
Richardson, Edwin	„	18	4	11
Skinner, John	„	2,390	1	11
Turton, T. W.	„	15	6	1
Whitehouse, Edwin	„	25	12	5
Overseers of the Poor	„	44	1	2
Horton, Isaac (Exors. of)	„	225	2	0
Hill, Charles J.	Coventry	28	3	0
Rolez, J.	Manchester	10	8	0

SURREY.

Saunders, Edward, 79, High Street, Croydon, jeweller. Unsecured Liabilities, £429 7s. 8d. Estimated Net Assets, £12 10s. Composition of 7s. 6d. in the £, payable 3s. 9d. upon execution hereof, and 3s. 9d. on September 17, 1890; the last payment secured. Deed of Composition dated July 17, 1890; filed July 23, 1890.

Creditors.		£	s.	d.
Jones, A.	London	14	16	0
Stoessiger, F.	„	24	8	0
Saunders, Fanny	Southampton	28	10	0
Herrington, G.	Sutton	20	0	0
Thompson and Son	London	45	0	0
Barker Bros.	Birmingham	38	18	3
Mahlendorff, F.	London	49	19	10
Joseph, B H., and Co.	Birmingham	26	17	1
Bragg, J. and T.	„	26	7	0
Bendon, G. and Co.	London	15	5	3
Mayer and Son	„	14	10	3
Spicer, C. E.	„	15	4	0
British Mutual Bank	„	96	0	0

BANKRUPTCY.

Re HOOK, JOHN JAMES, Midsomer Norton, Bristol, watchmaker and jeweller. The liabilities were £361 4s. 6d., and the deficiency £250 14s. Debtor began business in 1882 with about £80 capital, borrowed from his father. The Official Receiver said he had sold the stock by valuation for £74, and he was now collecting the debts. Debtor said he had a brother-in-law who had gone away, and for whom he had been a surety to money lenders.

BREWIS v. GOWLAND.—This was an application in the Durham Chancery Court for the administration of the estate of George Hay Gowland, of Sunderland, silversmith and jeweller. Under his will the late Mr. Gowland appointed three executors. One predeceased him, another refused to act, and his widow proved his will as sole executrix. The plaintiff was a creditor for £1,100, and it was considered desirable that the estate should he administered by the Court. Mr. Meynell asked the Court to appoint as receiver and manager of the business the testator's son, Mr. Charles James Gowland, who managed the business for his father for a period of ten years, and had carried on the business since his father's death. His Honour made an order appointing Mr. Charles James Gowland or some other person manager and receiver.

BANKRUPTCY PROCEEDINGS.

Arkinstall, Joseph, 3, Blackburn Road, Bolton, and Rushy Fold Lane, Halliwell, watchmaker and jeweller. Receiving Order and Adjudication: July 3. First meeting: 16, Wood Street, Bolton, July 15 at 11. Examination: C.C., Bolton, July 21 at 11½.

Bradley, William Robert, 841 and 843, Attercliffe Road, 50, Attercliffe Common, and Worksop Road, all Sheffield, draper, jeweller, and furniture dealer. First meeting: Official Receiver's, Sheffield, July 9 at 11. Examination: C.C., Sheffield, July 10 at 11½.

Davis, Richard Perkin, 20, Church Street, Lozells, and 169½, Hockley Hill, Birmingham, silversmith and jeweller. Receiving Order: June 30. Adjudication: July 1.

Davis, Richard Perkin, 20. Church Street, Lozells, and 169½, Hockley Hill, Birmingham, silversmith and jeweller. First meeting: 25, Colmore Row, Birmingham, July 22 at 11. Examination: C.C., Birmingham, August 6 at 2.

Imperiali, William Giovanni, 102. Edgware Road, W., late 38, Dewhurst Road, Brook Green, W., jeweller's assistant. Adjudication: July 4.

Imperiali, William Giovanni, 102, Edgware Road, W., late 38, Dewhurst Road, Brook Green, W., jeweller's assistant. First meeting: 33, Carey Street, W.C., July 9 at 1. Examination: 34, Lincoln's Inn Fields, July 17 at 12.

Pickwoith, James, 18, Hargrave Park Road, Junction Road, Highgate, late 96, Camden Street, Camden Town, St. Pancras, jeweller. Receiving Order and Adjudication: July 16.

Weinrabe, Abraham Maurice, trading as S. Weinrabe, 14, Burdett Road, Bow, wholesale jeweller. Receiving Order: July 3.

Weinrabe, Abraham Maurice, trading as S. Weinrabe, 14, Burdett Road, Bow, wholesale jeweller. Adjudication: July 7.

Weinrabe, Abraham Maurice, trading as S. Weinrabe, 14, Burdett Road, Bow, wholesale jeweller. First meeting: 33, Carey Street, W.C., July 30 at 11. Examination: 34, Lincoln's Inn Fields, August 5 at 12.

ADMINISTRATION ORDER.

Evans, Morgan, 20, Shipbuilder's Row, Aberystwith, clock cleaner. £29 14s. Seventeen reditors. June 13. No. 2.

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The Watchmaker, Jeweller & Silversmith.

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CONTENTS.

PAGE
Editorial ... 49
General Notes ... 50
The Diamond Market and Metals ... 51
Sheffield Notes. From Our Correspondent ... 51
Some Optical Properties of Gems. By W. J. Lewis Abbott, F.G.S. 52
Silver Hall-Marking in India ... 54
Merchandise Marks Act Prosecution ... 54
The Merchandise Marks Act ... 54
The Art of Practical Design for Jewellers and Silversmiths ... 55
A Nine Hours' Stroll through the Elgin Watch Factory ... 57
A History of American Clock-making... 58
American Custom House Statistics ... 59
As Others See Us ... 60
Methods of Ruby Mining in Burmah ... 60
How Ceylon's Treasures are found ... 60
Modern Jewellery Fashions ... 61
Curiosities in Earrings ... 61
Jewels are Non-Conductors ... 62
Diamonds ... 62
I. D. B.'s and the Cape Diamond Mines ... 63
The Retail Shops ... 64
Artificial Gems ... 65
Hints for Salesmen ... 65
Anecdotes of Rings ... 66
Coloured Films on Metals ... 66
A Fisherman's Art Carving ... 66
Mechanical Ocular Defects. By Dr. C. A. Bucklin. ... 67
How to Prepare Crocus ... 68
Applications for Letters Patent... 69
Recent American Patents ... 69
The Deeds of Arrangement Act, 1887 ... 69
Gazette ... 72

The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. The Watchmaker, Jeweller and Silversmith will be found an exceptional medium for advertising. Businesses for Sale, Situations, &c., per insertion, 6d. per line, prepaid.

Address all business communications to the Publishers,

Messrs. TRUSLOVE & SHIRLEY,
The Watchmaker, Jeweller & Silversmith,
7, ST. PAUL'S CHURCHYARD, LONDON.
Birmingham Branch: 22, HYLTON STREET.

Agents for New South Wales and Queensland:—
Messrs. BOSCH, BARTHEL & Co.,
409, George Street, Sydney.

EDITORIAL

In bringing their recent action for infringement of the Merchandise Marks Act against Mr. Henry Hyland, "watchmaker," of 32, Cheapside, a report of which appears upon another page, the London Watchmakers' Trade Protection Association have once more fully justified their existence.

It seems passing strange that, in the face of what is now so well understood to be the law of the land, there are still to be found people who—whether from the desire of a little extra gain, the wish to do as they like, or from "pure cussedness"—will set that law at defiance. But that such folk are to be found is an undoubted fact, and no further *raison d'être* for such an organisation as the London Association need be sought than the necessity for duly impressing these persons with the requirements of the law whenever and wherever they evince an anxiety to infringe it.

Cheapside, by-the-way, seems peculiarly unfortunate in the matter of these prosecutions, the majority of them up to the present having been instituted against the shopkeepers of that quarter. But it is to be hoped that the result of the latest action of the Association will be shown in a healthier and more legitimate trade generally for at least some time to come. In the meantime, as the costs allowed in most of these cases are quite inadequate to meet the expenses of getting them up and conducting them to a successful issue, members of all branches of the trade would do worse than subscribe to the funds of the London Society and the similar existing institutions in the provinces.

Even if, as some pessimists foretell, the result of such prosecutions should be to eventually open the eyes of the public to the lower cost of foreign (*i.e.* Swiss) watches, it is to the direct and manifest interest of all who are doing a legitimate business to trade on the merits of the goods they sell, and not to foist them upon the public under false descriptions.

GENERAL NOTES

Mr. Frederick B. Box, of 6, Thavies Inn, Holborn Circus, informs us that he has sold the business of Mr. A. Wixley, 3, High Street, Southend, to Mr. R. A. Jones, of Stoke-on-Trent.

Discovery of a Large Diamond.—The London secretaries of the Jägerstontein United Mining Company (Limited) have received information from the company's head office at Kimberley that a diamond has been found in their claims weighing 221 carats.

"Young man," exclaimed the moralist, pointing to the second hand of the clock as it marked the flight of the moments into eternity, "what is the language of that timepiece!" "It has none, sir," replied the idler, "it goes without saying."—*Philadelphia Press.*

Advices from New Zealand state that a man named Alexander M'Lean, who is believed to be from Sydney, was captured last month, while engaged in plundering Mr. James Howden's jewellery shop in Queen Street, Auckland, on Saturday afternoon, during the temporary absence of the owner. He had £700 worth of booty packed up ready for removal.

From the Land of Dollars and Cents.—Jeweller (to new boy): Well, how have you been going on while I have been away? Any trade? New Boy (with pride): Yes, sir, in gold rings—rather a good sale, I think. Jeweller: Did you know all the prices? New Boy: Yes, sir, they were marked 18c. inside, and the gentleman took all there were left!

A fire broke out on the night of the 12th inst. in the workshops of Messrs. B. H. Joseph and Co., of Birmingham, caused by the overheating of their melting furnace. Fortunately, this was discovered almost immediately after it broke out, and there was little for the firemen to do on their arrival on the scene. But for the timely discovery the whole block of buildings would have been razed to the ground.

The "Husband's Ring."—Why shouldn't husbands wear wedding rings? It is a custom in Germany, and their wives will appreciate it. An Oxford Street jeweller has, according to a correspondent in the *Pall Mall Gazette*, introduced a husband's ring, which, he says, is selling well. It is of gold, twisted in the form of a true lover's knot. It wouldn't do to have a plain ring, as widowers sometimes wear their late wife's wedding ring; and for a married man to be mistaken for a widower might lead to awkward complications.

Electric Spectacles.—A novel and, it is claimed, very beneficial article has been produced in the shape of electric spectacles and eye glasses. They are made under the invention and patents of W. Friedlander, a jeweller of Portland, Ore, U.S.A. The new device consists of copper and zinc adjustments to the temples of spectacles and to the nose pieces of eye glasses, whereby a faint current of electricity is generated and materially assisted by the moisture of the skin. This improvement, it is said, will be of great benefit in strengthening the optic and other nerves. The patentee invites correspondence as to the securance of State rights for the use of the invention.

Messrs. Lambert, goldsmiths and jewellers, 10, 11, and 12, Coventry Street, in the ornamentation of the trowel used by Mr. Deputy Green to lay the foundation stone of the depôt erected by the Commissioners of Sewers in Upper Thames Street, on Friday, July 18, produced a most artistic piece of work. The handle of fine white ivory is carved on the front with the City arms, and at the back with the initials, "F.G." At the back of the blade is an engraving of the crest and armorial bearings of Mr. Green, and the front of it is chased and bears this inscription: "The Foundation Stone of the Depôt erected by the Commissioners of Sewers of the City of London in Upper Thames Street, was laid with this trowel by Frank Green, Esquire, Deputy, the Chairman of the Commission, on the 18th July, 1890."

The Origin of the Steel Pen.—Mr. Joseph Gillott was a Birmingham working jeweller in 1830. One day he accidentally split one of his fine steel tools, and being suddenly required to sign a receipt, not finding his quill pen at hand, he used the split tool as a ready substitute. This happy accident, according to *Answers*, led to the idea of making pens of metal. It was carried out with secrecy and promptitude, and the pens of Gillott became famous. The manufacture of metal pens has been as important as any invention connected with business and education since that of printing. There are now numerous firms which produce as many pens every day as all the geese in England could have supplied in a year. There is still, however, a large demand for quills and quill-pens, but for common use, in these days of universal education, the importance of Gillott's first invention is incalculable.

A firm of jewellers in the West Central district are, according to a correspondent of the *Daily News*, making a speciality of clock souvenirs, in the shape of coloured views of some of the principal buildings of London, in which are fixed tiny horologes in their proper places. There are St. Paul's, the Houses of Parliament, the Inns of Court, etc., and these are severally commended to clergymen, legislators, barristers, etc. It is a question, however, whether these souvenirs will not be more acceptable to visitors to London than to those who are supposed to be more immediately interested. As a rule, says the writer, I fancy professional men do not care to be reminded of "shop" when they are at home, and it is quite certain that exhausted Members of Parliament do not anticipate with much glee having to look upon the face of Big Ben again through the fogs of November and December.

Russian Jewellery "Revision."—In Moscow lately there has been a revision of all the jewellers' shops by a Government Commission, and some of the jewellers have come heavily to grief. One firm is said, according to a contemporary, to have had no less than 80,000 roubles' worth of jewels confiscated and destroyed. This firm, named Nemirow-Kolotkin, have appealed to the Commission to at least return them the precious stones with which the jewellery was embellished, but have as yet received no reply. In many large shops much jewellery in gold and silver work has been made useless, another firm having had 1,000 roubles' worth destroyed. Much of this had no proof stamp upon it. In some cases deception had been practised; in making up the articles it was found the precious metal's weakness had been made up inside with lead. The Commission promises to continue its work, and to "revise" the stocks of the hawkers at the coming fair. Altogether the goldsmiths of Moscow seem to be having an interesting time.

A Diamond Fable.—A diamond found itself, to its extreme annoyance, lying side by side with a piece of common black-lead under a gas jet. "Disgusting!" it remarked; "this is not fit society for a diamond of the first water." "Pooh!" said the black-lead, carelessly, "you're only a bit of carbon like me." The diamond flashed furiously. "We are absolutely and fundamentally different. I have nothing in common with you, so be silent." Presently in came a chemist with half-a-dozen pupils. "See here!" he said, taking up the diamond, and applying to it the full force of the blow-pipe; and lo! to its horror the diamond felt and saw itself swelling up into a horrible black mass before resolving into an invisible and noxious gas. As it faded away its last recognised sensation was of a malicious gleam emanating from the black-lead.—The rich too often regard themselves as diamonds, and forget that in the Great Chemist's furnace they will prove to be of the same elements as the poor.—*Osmond.*

Wedding Presents of Jewellery.—Some "Society" bridegrooms must needs make very handsome presents to their brides, though at many of the fashionable weddings, the family heirlooms in the way of jewellery are re-mounted and re-arranged, and presented—at all times considered a very handsome present. The Marquis of Bath gave his wife jewels to the value of £30,000 on her wedding-day, whilst the Dowager Duchess of Newcastle's presents in gems were worth quite £100,000. A head ornament was valued at £15,000, and a single diamond between £8,000 and £10,000. The most valuable single row of pearls was the subject of a wedding gift. This was presented to Lady Tweedmouth; the jeweller who made it was two years in executing the order, and corresponded all over the world in order to secure the purest and most perfect specimens. It was worth from £10,000 to £12,000. A somewhat similar present at the marriage of the Princess of Wales was the gift of several rows of pearls. From that time Her Royal Highness went on collecting them. They now form one of the handsomest sets known, and their value is anything between £10,000 and £12,000.

An advertisement on another page calls attention to the recent removal of The Wholesale Traders' Association (Birmingham), from Temple Row to larger premises in Midland Chambers, 26, Corporation Street. This removal has been necessitated by the great increase in the business of the firm during the past few months, which is in itself practical proof and direct testimony of the value of the firm's system of carrying on their affairs, and of the estimation in which it is held by the trades concerned. This system, as set forth in a circular published by the association, comprises the following distinctive features :—1.—It (the firm) does not claim to serve all trades. 2.—Its (the firm's) sphere of action being limited to the jewellery and kindred trades, members' interests are more efficiently protected. 3.—Subscribers are kept posted on all matters affecting the credit of a person they have previously enquired about. The foregoing should, we think, be sufficient to induce those who find it necessary to employ this kind of agency to give The Wholesale Traders' Association a trial. A prospectus containing full particulars as to terms, etc., will be forwarded on application.

The Diamond Market and Metals.

The Diamond Market.—The usual steamers arrived during the month, but supplies were somewhat limited and quotations being fully maintained in the face of a large number of would-be buyers of the raw material. Stiff prices are still the order of the day. Both the *Paris* and *Amsterdam* markets are brisker; and in the former, trade, both speculative and for orders, may be now said to be fairly prosperous. At Amsterdam, according to *De Diamant*, the demand for rough and cleavages is good, while that for small and middle-sized stuff is on the increase. Reports from *Kimberley* state that since the De Beers' Combination has left off selling in the lump to a syndicate, prices are not affected perceptibly.

Metals.—The markets generally have been fairly active, and copper especially has again improved. The latest official quotations on the London market are as follows :—*Silver.*—54¼d. per oz., market unaltered. *Copper.*—Chili bars, G.O.B.'s and G.M.B.'s, cash, £58 2s. 6d. to £58 10s.; three months, £58 10s. to £58 17s. 6d. Australian, nominal. *Tin.*—Fine foreign, cash, Straits, £93 15s. to £94 5s.; Australian, £93 17s. 6d. to £94 7s. 6d.; three months, Straits, £94 7s. 6d. to £94 17s. 6d. *Lead* is dull. Spanish soft, £12 17s. 6d.; English, ordinary brands, £13 2s. 6d. *Spelter* is firm. Ordinary brands, £23 7s. 6d.; special ditto, £23 10s. to £23 15s. *Quicksilver.*—The importer's price is £10 5s.; second hands, £9 19s. 6d.

SHEFFIELD
NOTES

From Our Correspondent.

The honour of being made Master Cutler falls this year to Mr. Robert Colner, of the firm of Jonas and Colner. Besides his functions proper, as head of a famous corporation, the Master Cutler has many onerous public duties to discharge. He opens bazaars, lays foundation stones, heads subscription lists, and is generally very much in evidence from the beginning of his year of office to its close. Each succeeding Master Cutler tries to surpass his predecessor in the glorious "Feast" which inaugurates his year of office. I don't mean as regards the viands and the wines, the plate and the cut glass, the flowers and the music. These are all, as a matter of course, perfect of their kind, whoever is in office. It is in the quality of the guests where the emulation comes in. Happy is the Master Cutler who can bag a Prime Minister, especially if that dignitary has something to say that will be reported from one end of Europe to the other. An ordinary Cabinet Minister is coming to be looked upon as very small potatoes, and a common titled big-wig is absolutely of no account unless he is one of our neighbours. It is becoming more and more the ambition of each succeeding Master Cutler to make his "Feast" the Banquet of the North, and a rival to that of the Lord Mayor.

Not very much is heard just now about the M'Kinley Tariff Bill. Perhaps it is because our fiery spirits are all at the seaside, but certainly the excitement seems to have cooled down. The only visible result of the late meeting is a very funny correspondence now going on between Mr. Howard Vincent, M.P. for the Central Division of Sheffield, and Sir Frederick Thorpe Mappin, member for the suburban constituency of Hallamshire. The subject matter of their debate is serious enough in all conscience, but the fun comes in in the general impression conveyed that neither of them know very much about what they are discussing. Each disputant is a ponderous debater, and although the letters begin "My dear Sir Frederick" and "My dear Mr. Howard Vincent," everybody can see that, whoever is written *to*, the general public are written *at*. The fact that the writers are of different party colours constitutes the whole correspondence as so many election addresses, which are about as instructive as the ordinary run of such things are nowadays.

One good result the M'Kinley Tariff Bill has had which should not be overlooked. It has caused a brisk demand for the Sheffield-made goods affected by it. American merchants are increasing their stocks on the strength of the ultimate passing of the measure. Nor need one's satisfaction at this state of affairs be spoilt by the reflection that a reaction may be expected to follow this exceptional demand. It is the unexpected which happens nowadays, more even than formerly. There are even people who maintain that the M'Kinley Tariff Bill is only the last desperate effort of Protection to keep its hold, and who profess to be able to detect signs of a change in American sentiment with regard to fiscal matters. Be this as it may, the Board of Trade returns show that at present we are doing a very fair amount of trade with the United States.

What is silverine? Reasoning from analogy one would say that it bears the same relation to silver as butterine does to butter. It is never safe, however, to indulge in abstract reasoning on matters of this kind. It is claimed for silverine that it looks as well as silver and that it wears as well. If this be so then it is as good as silver, from which it follows that it is worth as much. But then the makers of it don't charge as much for it, which is very good of them. These reflections passed through my mind the other morning as I passed along Norfolk Street, and saw—what at this time of the year is a very common sight—a long string of conveyances filled with artizans and their wives out for a holiday. They were drawn up in front of the works of Mr. Maurice Baum, whose recent extension of premises I alluded to a few months ago. The question at the head of this paragraph was suggested by a legend in golden letters on the warehouse windows. I daresay Mr. Baum would be happy to answer the question if I asked him, but pressure of business has hitherto prevented my doing this.

Wanted—a good dog muzzle! The old strap muzzle is a mockery, a delusion, and a snare. It answers its purpose so far that it makes the dog feel sufficiently uncomfortable, but it does not prevent that estimable quadruped from helping himself to a piece of the calf of your leg if he feels so disposed, and he has felt so disposed to an alarming extent in Sheffield recently. The dog owner pays his fine with an air of injured innocence, pointing to the muzzle on the beast's nose, which, for any practical use it is, might as well be on its tail. Out of this state of things has developed the wire muzzle, and scores of dogs may now be seen running about with what appear to be small toast racks on their noses. Here comes in the opening for a novelty in the electro-plate trade. There appears to be a dearth of wire muzzles at present in the market, consequently, something that is at the same time comfortable, ornamental, and efficient would be sure to take.

I hope the foregoing suggestion may not be considered derogatory to the dignity of the trade. But in truth the electro-plate trade might do worse things than go in for dog muzzles. A case in point is a collection of articles now in the show window of a firm very much in evidence as far as the general public is concerned, whatever it may be with the shop-keepers. It is called the "Stanley" set, if a show-card beside it may be trusted, and consists of a series of articles made out of sections of elephants' tusks, and put together not exactly in the style that Godfrey Sykes would have done it. In the centre is a statuette, evidently intended for the intrepid explorer after whom it is named. Now Sheffield has the honourable distinction among towns of an equal size of possessing only one public statue. This the town council had the good sense to remove from the centre of the town, where it originally stood, to the shadiest nook of Weston Park. The authorities, unfortunately, have no control over statuettes in show-room windows, so that one must of necessity take refuge in the hope that the Stanley set may ultimately be sold, and so make room for something else. As I pass that way every day, I pray that it may be so.

The remarkable article in *Truth* in which "Labby" professes to dissect the National Telephone Company in the interest of the investing public has a passing interest for us in Sheffield. Whether or not it pays the "National" to lose money as a local Exchange in Sheffield in order that it may complete its system as an inter-town Exchange, is a matter solely for its own directors to decide. What the general public may reasonably complain of, however, is the undue multiplication of standards and poles which the presence of two rival companies in the same town necessitates. There are people who profess to see an element of the picturesque in these adjuncts to modern civilisation. To most people, however, they are an unmitigated nuisance, and I own to a considerable amount of sympathy with men like Mr. Sybray, whose desire is to hasten the time when all wires will be placed underground.

As to the telephone system itself, it is astonishing how people got along without it. In the case of a large electro-plate concern of the present day it appears absolutely impossible to dispense with its assistance. Although many factories employ between seven and eight hundred hands within their own borders, yet all of them have in addition to communicate daily with quite an army of "out-workers" and members of auxiliary trades. Ivory merchants, gold and silver smelters, cabinet case makers and the like, although miles off, are now within speaking distance of the warehouse. How this facilitates the getting up of orders may readily be imagined, and it is almost as difficult to conceive of going back to the old system of messengers as of going back to the Heptarchy.

Some Optical Properties of Gems.

By W. J. Lewis Abbott, F.G.S.

(Continued from page 31).

We next come to dispersion, which differs considerably in gems; to it we mainly owe that remarkable quality which we call *fire* — the blazing forth in gems of the prismatic hues of the solar spectrum as exhibited in the rainbow. The dispersive power of the diamond was early recognised, and many methods were employed to test "if it were complete" by various connoisseurs. A very good way to show it is to lay a piece of white blotting paper on the counter, turn the stone downwards, then gradually turn it towards the sunlight until it reaches the angle at which it reflects its dispersed light upon the paper, which will there be split up into dozens of miniature rainbows; the slightest angular movement suffices to cause them to fly about with fiery activity, and in well-cut stones has an impressive effect and speaks volumes for the beauty and perfection of the stone to a purchaser. The coefficients of dispersion are given as follows:—borosilicate of lead, ·049; diamond, ·044; flint glass, ·036; ruby, ·032; blue sapphire, ·029; red garnet, ·027; tourmaline, ·019; crown glass, ·015; rock crystal, ·014. It will be noted perhaps with surprise that it is higher in borosilicate of lead than even the diamond. This is the substance that was employed in the making of the old French pastes.

Next let us look for a moment at the refracted ray. Sir David Brewster gives the following as the *refracted indices* compared with glass for the yellow ray:—diamond, 2·75; zircon, 1·95; ruby, 1·77; chrysoberyl, 1·76; spinel, 1·75 to 1·81; crown glass, 1·5. I am making a number of researches into this subject, which I hope shortly to publish, giving the refractive indices of all the gems for each of their axes, which often vary considerably in different directions.

I need not remind you of any of the thousand-and-one illustrations of refraction in ordinary daily life, from the apparent bending of the spoon in a glass of brandy-and-water to the mirage of the desert, in many instances we appear to see things where they do not exist, at others we fail to see them where they do! It is from this that when we look into a cut diamond of ordinary size we can see *into it* but not straight *through it*, a point of cardinal importance. It is also upon this property of refraction and reflection from inner surfaces back to the observer that the principles of cutting ought to be based. You will have gathered from what has been said of these optical laws that by cutting a gem its angles should be made to bear such relation to each other that the full harvest of the choicest flowers of the optical world are reaped, and alas! also, that they may not only be disfigured but almost destroyed! It is also remarkable how a little colour in a stone may, if judiciously placed, give colour to the whole stone. Take, for instance, this abominable forgery known as a sapphire doublet. The front is a garnet, the surface lustre of which approaches towards that of the sapphire, the back a piece of blue glass, which gives the whole the colour and appearance of a beautiful sapphire to those who do not understand dichroism.

We next come to a point of cardinal importance, viz., that of complementary colours and polarization, but I regret that this is too long to go into here, and must reserve that for another and separate paper. I may, however, just say that certain gems, all which crystallize in the isometric system, allow of free passage of light in all directions, and only act upon light like an ordinary glass prism, so that their body colour is always monochroic, and that other gems which crystallize in other systems act differently upon light, doubly refracting it, and under certain conditions split it up into its complementary colours such as spoken of in relation to the work of Wünch, so that when viewed they are dichroic. By this means, a monochroic spinel, or one where the same colour pervades, though of different shades, can instantly be distinguished from a dichroic ruby where the two prevailing tints are the complementary colours, which together form the colour of the stone.

The two most remarkable examples of dichroism, or polychroism, are iolite and tourmaline. In the former it is a different colour altogether in all three axes, in a tourmaline and some sapphires it is different in two. Many of the Australian sapphires show a good blue in one direction and a deep pistachio or Brunswick green in another. Of course this must not be confounded with parti-colouring so often present in gems. I have proposed the term axechroic for this phenomena.

There is a phenomena that is often mistakingly called dichroism in certain gems, but for which I have proposed the name nocturchroism, from the fact that they show a different colour by night to that exhibited by white daylight. At the top of these stands the curiously beautiful gem, the Alexandrite—red by night and dark green by day in good clear specimens. They are a variety of chrysoberyl. You will notice crystals from Siberia and Ceylon, which are only translucent, still retain their colour by night light, others have it to a slight degree. Mineralogically there is nothing to separate them definitely from the green chrysoberyls. The fact is every gem is more or less affected by night light. Before me is a beautiful red sapphire, which by this night light I cannot pick from the rubies, but by day it is a fairly good blue. There are a number of rubies put together there, which look all about alike now, but by daylight they vary from violet to pink. Obviously then rubies improve by night light. Sapphires, on the other hand, suffer badly and go inky. The ideal sapphire is the one that retains its colour by night.

Chatoyancy, or the Phenomena of Catseyes.—If we take a silk hat when the room is illuminated by *one* light only, we see the hat reflects light and appears shining over the half of it thus illuminated, but we see down the front of it a line of intense brightness. We move the hat round, the ray remains; we move the light, the ray moves. Now, if we remember the fact that the hat is covered with little fibres, lying down in a circular form one upon the other in the same direction all round, at the place where we see our ray they present (so to speak) a series of prisms towards the light which reflect it much more than the rest, hence we get the ray. Similarly if we get any acicular mineral and cut it in a dome, there must be a line where the fibres similarly catch the light, and these will reflect back a ray of greater intensity. The flatter the curve of the dome, the broader the ray; the sharper the curve, the narrower the ray. The most valuable stone that occurs in this form is the chrysoberyl, or true Oriental cat's-eye. There are also numerous varieties of fibrous quartz; those from Ceylon being of a similar colour to the true cat's-eye, although much less bright and incomparable in value; the Hungarian being very different, more opaque and generally of some comparatively dull green colour. There is further a fibrous variety of corundum, usually of a mauvish brown. Obsidian, too, when the flow has been quick and the bubbles elongated in the direction of the flow, is *chatoyant*. Before me is a beautiful cone struck with one blow by those expert flakers, the prehistoric people of Mexico, also other implements and ornaments struck by single blows from chatoyant obsidian. There is also the mineral that passes under the name of crocidolite. In reality it is not crocidolite at all, but a form of quartz that has replaced it in the process known as *pseudomorphism*, crocidolite itself being an asbestiform mineral, too soft and incoherent to cut. *Asterism*, closely allied to cats'-eyes, is the phenomena of star stones, only, instead of the acicular structure running all in one direction, it runs parallel to the planes of the six-sided crystal; consequently, in cutting such a structure along the basal plane on a dome, we pass the highest point of six lines of aciculation, and the result is that we get—not one single line—but six, meeting in the centre.

It is possible for this phenomena to occur in a variety of stones, but it is generally confined to the corundums, giving rise to star-sapphires and star-rubies with their six-rayed stars, meeting in the axis of the crystal. Upon moving the light in a circular direction round the axis of the crystal, the centre of the star can be made to revolve round it, carrying the star with it, or if the stone be moved about the star moves over the surface circumscribed by that orbit.

When a star occurs in garnet or spinel, or any stone crystallizing in the isometric system, the rays are four in number. Before me is a unique specimen—a four-rayed ruby. This may seem to contradict the foregoing, but the fact is two of the rays are suppressed, owing to a peculiarity of crystallization. These apparent contradictions will be explained when we come to speak upon the crystallography of gems. There is also another very rare specimen, which one might term a physical or structural star, in contra-distinction to the others as optical stars, which shows a star before it is cut. The blue of the sapphire in this specimen is much deeper than ordinary star sapphires, and the acicular structure, instead of running parallel to faces of the prism, lies in bundles, as it were, joining the centres of the prismatic faces crossing in the centre, giving rise to a white or light blue cross upon a dark blue ground. The crystal is 13 millimetres in diameter, and the ray has a mean width of a little over one.

We next come to the gem of the dynamo-metamorphists—and seeing the ascendancy of this school, one can hardly be surprised that the stone should have been brought into such popular favour of late years. Volume of earth movements that it is! and recorder of pressures which cause the solid crust of the earth to *flow*, not only in the visible foldings of mountain-making, but in the quite inostensible, unobservable minuteness of molecule over molecule, until this beautiful structure was produced! From moon- to sun-stone the passage is unbroken; often, however, the sun-stone's beauties are enhanced by the introduction of minute spangles of mica or other substances, and in some instances it is wholly due to the latter. I also think that the prismatic effects of Labradorite can claim a dynamo-metamorphic origin.

How many more substances we shall enlist into the swelling army I cannot say, but at present I should not like to say opal; it is, however, certain that it owes its matchless colours, not to pigmentation, but to minute fissures: that this is the case is further shown by the fact that the colours are not obtainable by transmitted light; and further, the same effects are sometimes obtained by accident by striking a piece of quartz, or cleaving minerals, in which case, as in that of the opal, it will be observed that the colours follow the sequence of the solar spectrum; and Newton, in those lovely phenomena known as *Newton's rings*, was enabled to measure the exact thickness of the intervening spaces, that gave rise to the different colours. What these fissures contain is a moot point, but I think it is pretty certain that they contain the elements of water, and, if it were not for saying something which might be turned to ill effect against the novel-beplotted gem—whose beauties were sufficient to induce some of the Christian Fathers to regard it as the residence of the Deity—I should say that it is possible for these contents to be driven off, and require saturation in certain liquids, to restore them to their pristine beauty. This is further exemplified in that variety known as hydrophane, which only shows its prismatic colours *when* immersed. Usually the fissures have a general strike; and if only one set be present the colour is uniform and static, as we often see in the Australian specimens, where quite extensive zones of the same colour exist, changing over the area perhaps to two or three colours, although usually some tint of blue or green; this is interrupted in various degrees until it passes into the *harlequin* variety, where there are a number of sets dipping and striking at various angles and directions. Often one dipping at an angle to the strike of another is visible with a hand-lens, or even the naked eye, and when viewed along the dip, appear as minute acicular fissures, which, when viewed at right angles present the characteristic gorgeous effects of prismatic colours; the direction in which an opal should be cut is that which lies at right angles to its maximum fissuring. How often do we find an opal that when viewed at right angles to the girdle looks very inferior, thick, and milky!—because we are approximating the strike (or line along which the fissures lie)—but upon turning it slightly on edge, what a glorious change! this is the direction in which the stone should have been cut, although it might have been materially smaller, still, it is fine stones that command both sale and price. It will often be observed that opals apparently change their colours upon being turned a little backwards and forwards; this is owing to the fact that one set of fissures which reflect, say, green light, is brought alternately over others which a moment before were in the direct line of vision, and whose thickness was such as to give quite a different colour, causing the colours to change with lightning rapidity, the change being, however, more apparent than real, and is only one of many hundred lovely and interesting phenomena that may be observed by a little attentive application. There are many other features of opal that might be pointed out, but perhaps their better place would be when we come to consider the mineralogy of gems, which differentiate the Australian, Hungarian, and Mexican opals. You will, however, I humbly trust, have seen by this necessarily sketchy introduction that what is true in regard to many other things is also true in regard to the optical qualities of gems—*you must know what to look for before you can hope to find it*; but I hope I have said sufficient to make you admit that I have added just one more quota to the fact that there is no branch of business that cannot be benefited by a cultivation of the science that underlies it; and that even the most selfish and sordid-minded will receive at her hands a full recompense and reward for all the solicitations he may make of her, while she will elevate the common drudgery of his life to perennial fields of pleasurable and profitable observation.

(To be continued).

Silver Hall-Marking in India.

THE Earl of Northbrook last month asked the Secretary of State for India whether the opinion of the Government of India had been asked with regard to the proposal that a system of "hall-marking" should be applied to silver articles manufactured in India; and, if any despatch had been received from India on the subject, whether he had any objection to lay a copy of it upon the table. He said he desired to congratulate the Government on being able in this Session to remedy the grievances that had been felt for many years in connexion with this matter by persons engaged in the manufacture of silver articles in India. Twelve years since a Committee of the House of Commons thought that the duty on silver plate in India should be repealed, and nine years ago Mr. Gladstone, when he was Prime Minister, also expressed a desire that it should be repealed. But it had not been repealed until the present year, and he could assure the Government that there would be a feeling of great gratification in India that it had at last been done. The Chancellor of the Exchequer, in another place, had explained that it was not the intention of the Government to abolish the system of compulsory hall-marking in this country, and he indicated that it was intended that a system of hall-marking silver articles should be established in India in respect of articles exported to this country. To export silver articles from India to England for assay purposes, and then to have to send them back again, would be most injurious to the manufacture of silver in the former country. The Chancellor of the Exchequer very properly explained that the Government did not intend to take any action in this matter without communication with the Government of India, and that they were in communication with that Government on the subject. That statement was made three months ago, and he would ask whether any despatch had since been received on the matter.

Lord Knutsford said that the Secretary of State for India had requested him to reply to the noble earl's question. He would point out that the intention of the Government was indicated in the speech of the Chancellor of the Exchequer. The Government had communicated officially with the Government of India, who did not appear to be content with the statements of the Chancellor of the Exchequer. The correspondence on the subject was not yet complete, but there would be no objection as soon as it was complete to lay it on the table of the House.

Merchandise Marks Act Prosecution.

AT the Mansion House, last month, Mr. John Hyland, a watchmaker, of 32, Cheapside, attended before Alderman Sir Robert Fowler on a summons, at the instance of the London Watch Trade Protection Association, charging him with an infringement of the Merchandise Marks Act, in having on July 30 had in his possession for sale a watch to which was applied a false trade description as to the country in which it was produced. He pleaded "Guilty." Mr. Forrest Fulton, who was counsel for the prosecution, said that the defendant had carried on business as a watchmaker in the City for a number of years, and he had undoubtedly taken a wise course in pleading guilty to the charge, for the case was clear. The object of the association was to prevent the sale of worthless foreign watches under a false description as English goods, and on July 30 Mr. E. Moore, himself a practical watchmaker and a leading member of the association, saw the foreign silver watch, in respect of which the charge was brought, in the defendant's window exposed for sale. It bore on its face the defendant's name and address, with the addition of the word "London," and it was labelled, "London finished three-quarter plate lever, £2 2s." It bore the Birmingham hall-mark. Mr. Moore purchased it, and found that it was not a lever watch at all, and that the whole of the works were foreign made. The case and face were Swiss, and the defendant's name and address had been painted in recently. At the time of the sale the defendant's premises were full of watches of that description, but since the summons had been served the stock had been cleared out. Mr. Fulton asked that in addition to any fine that might be imposed the defendant should be mulcted in the costs of the prosecution and of the expert witnesses in attendance. The defendant said it was absurd for any one, especially a trade rival, to expect to buy any English lever, for £2 2s., but, as a matter of fact, the misleading label was accidentally placed on the watch by his manager. It had actually cost him £1 17s., so that the profit charged was not large. Sir Robert Fowler said the full penalty was £20, but, considering the defendant had already paid £3 3s. as the costs of an adjournment, he should impose the mitigated fine of £10 and £5 5s. costs, with the alternative—failing a distress—of a month's imprisonment. The money was paid.

The Merchandise Marks Act.

Report of the Select Committee.

THE Select Committee of the House of Commons, appointed to ascertain whether any alteration is required in the provisions of the Merchandise Marks Act, 1887, or in its administration, have presented their report.

It states that the committee have examined many witnesses representing various trades, the shipping industry, the members of chambers of commerce, officials from the Customs department, and others.

As a result there seems to be a consensus of opinion that the Merchandise Marks Act, 1887, has generally been most beneficial to the manufacturing interest of the country, and that the importation of fraudulently marked goods, or of goods bearing a false indication of origin, has materially diminished since the Act came into operation.

Certain allegations of harsh administration of the Act by the Customs authorities, and of over-straining its penal provisions, have been carefully investigated by the committee, who, after a searching examination, have convinced themselves that that department, having regard to the novel and onerous duties imposed upon it, has acquitted itself with great fairness and with a just interpretation of the powers conferred upon it by the statute.

One of the most important points into which the committee had to inquire was that raised by witnesses on behalf of the shipping interest, who contended that that industry was being seriously damaged by the inconvenience caused to shippers through the examination of goods in transit. The committee have inquired minutely into that question. They cannot recommend the abolition of the examination of goods in transit, as they are of opinion that such abolition would facilitate the importation into this country for transhipment to America and elsewhere of large quantities of goods bearing false indications of origin, or otherwise falsely marked, to the great detriment of the British manufacturers and workmen. Moreover, the transport of goods in bond from the port of importation to that of transhipment would entail, according to the evidence given by the officials of the Customs, very heavy expenses for watchers, which would have either to be borne by the Treasury or by the shippers themselves, who would therefore derive no benefit from the relaxation of the existing regulations. The evidence of the Customs authorities and the statistics supplied by them tend to show that there is no considerable diminution in the import to this country of foreign goods transhipped or in transit, and that any diminution which has taken place since the Act came into force in 1888 is not due to any extent to the operation of the Merchandise Marks Act, but may be fairly attributed mainly to other causes, notably the dock strike, and the subsidies given by foreign Powers to their mercantile marine.

The committee cannot adopt the suggestion made by some witnesses that the words "made abroad" should be substituted for the actual indication of the country of origin now required by the Act to be placed on goods bearing descriptive or other expressions in the English language. Such an alteration in the Act would nullify one of the leading principles adopted by the Conference at Rome and again at Madrid, and could not be maintained in any international convention for the purpose of preventing a false indication of origin being applied to goods. The name of the country, however, might be held to be a sufficient indication of origin without in all cases insisting on the name of the particular place in which the goods were made. The committee have heard the evidence of several witnesses who were in favour of the compulsory marking of all goods with the indication of origin. They are unable to recommend such an alteration in the existing law. They are of opinion that it would seriously restrict trade and virtually destroy the business of warehousemen, commission agents, and small masters. Such enactment would, moreover, of necessity involve the insertion of a clause in any international convention imposing similar obligations on this country in respect of goods made in England but sold abroad.

The evidence given before the committee has, in their opinion, conclusively proved that goods (notably articles of consumption) come into this country in large quantities in an adulterated form, but cannot, according to the evidence given by the Customs authorities, be detained under Section 3 (D) of the Merchandise Marks Act, because in most instances they bear no trade description, as defined by Sections 3 and 5 of the said Act. The committee are of opinion that much harm is being done to legitimate trade by the impunity with which spurious articles are introduced into this country. They therefore propose that the Act should be amended by making the Customs "entry," which must bear a description of the goods imported, a "trade description" within the meaning of the Act. The adoption of this amendment would, in the opinion of the committee, give the Customs power to detain goods the "trade description" of which is false as to the material of which they are composed.

The non-official witnesses examined before the committee were unanimously of opinion that prosecutions under the Merchandise Marks Act should in future be undertaken by the State. The committee recommend that the solicitor to the Board of Trade, or the solicitor to the Customs, should prosecute in cases affecting the general interests of the country, of a section of the community, or of a trade, there being in such cases no sufficient motive to induce any individual to incur the expense, responsibility, or trouble of a private prosecution. The committee consider that State prosecutions should not be undertaken for offences against private property, such as forging or improperly using trade marks or trade names. The prosecutions in those instances should be left to the person, firm, or corporation aggrieved.

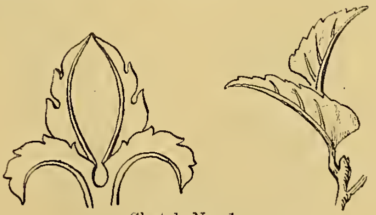
The committee have received abundant evidence that in the opinion of the mercantile community it is of the highest importance in the interest of honest trading that an international convention should be entered into with such foreign countries as are willing to adopt the principles of the Merchandise Marks Acts. The committee entirely share this opinion, and trust that Her Majesty's Government will continue to avail themselves of every opportunity to secure such international arrangements as will prevent the sale of falsely marked merchandise in all countries that are parties to the convention.

Baron Henry De Worms, Colonel Hill, Colonel Makins, and Messrs. Gray, Hozier, Giles, Frank Hardcastle, Mundella, Colman, Hoyle, M'Ewan, Richard Chamberlain, Jasper More, Blane, O'Keefe, and Vincent were members of the committee.

The expenses of witnesses called before the committee amounted to £51 17s. 1d. Two watchmakers — one from Prescot and the other from Liverpool—were the only Lancashire witnesses whose expenses were defrayed by the committee.

The Art of Practical Design for Jewellers and Silversmiths.

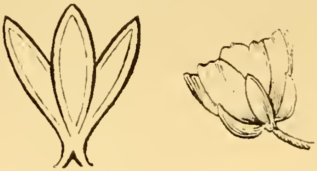
FROM the time of Joseph's cup of silver and Solomon's drinking vessels of gold, all the more costly articles of household use and decoration have been made of those precious metals. Roman homes gleamed with silver in the days of Horace; Cicero speaks of a shipload of wrought and stamped silver which came under his observation. If we had examples of all the styles of work produced from those days until now—the good, the bad, all mixed up together—the bewilderment would be great, but fortunately it is only the good examples that last through ages, and they are often lost during times of great political disturbances, so that the examples available to the student of art work at the present day, that are really representative historic examples, are not too numerous; and it is necessary for the designer to remember that, while looking to nature herself as the great primal source of all beauty and the only source from which to obtain original work, that the study of historic styles at the same time is indispensable, and should be studied in such a manner as to assist the student in discovering, if possible, the source from which the forms he finds there represented were derived. The anecdote in connection with the design



Sketch No. 1.

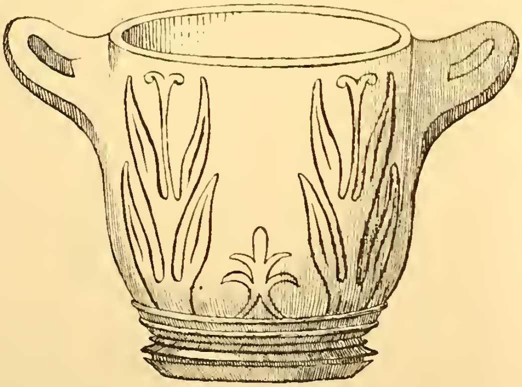
of the well-known example of Greek art, "The Corinthian Capital," will help to make clear what I mean by this.

It is related that a young maiden of Corinth died; her nurse collected in a basket the trinkets which had pleased her during life and placed them over her grave, covering the whole with a square tile. The basket happened to be placed on the root of an acanthus plant, the leaves and shoots of which grew up round the basket and curled round the corners of the tile. This interesting combination attracted the attention of Calimachus, the Greek architect, who from thence designed the beautiful Capital of the Corinthian Column, which is, at the present time, a familiar object of beauty to all observant and art-loving people.

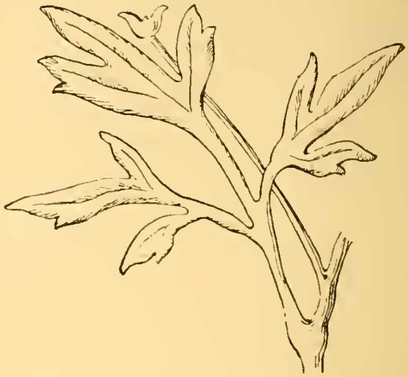

Sketch No. 2.

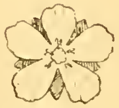
We may trace many of the historic details to natural sources if we look carefully for them and thus learn useful lessons. For instance, an examination of Moorish ornamentation will show details similar to sketch No. 1, which is evidently derived from a group of young leaves and the disposition of stem, as shown by the sketch from nature alongside it; again, in sketch No. 2. Another Moorish detail, which frequently occurs in their decorative work, is evidently obtained from the calix of a flower, and conventionally rendered according to the peculiar bent of the mind of the Arabian designer, who went out into the fields and woods to look for his outlines. So it will be as well for the student to remember that we have native plants and flowers equal in beauty to the lotus of the Egyptians or the acanthus of the Greeks, and equally well calculated to form the basis of a school of ornamental art.

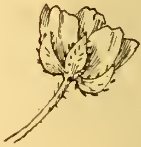
The introduction of the ellipse into ornamental composition always produces a pleasing effect, and the source of its origin is obvious, the petals of nearly all flowers and leaves of plants being elliptic. An instance of this will be found in sketch No. 3, where a simple elliptic outline is repeated in the form of a border with a very pleasing though simple effect, which is obtained by the repetition of the same form at a certain angle in relation to each other. The most important element in ornamental composition is the relation which one form bears to another in harmonic proportion. After a symmetrical outline has been produced the adornment of the same must be carefully considered; if the detail be inharmonious the faults are rendered more conspicuous by contrast to the gracefulness of the general design. True combination is to ornament what composition is to a picture—without it there is no unity and the entire conception is broken up.


No. 4.—Etruscan Vase.

The few simple examples in the three sketches referred to, will serve to show in an elementary way a connection between some of the historic conventional forms and natural forms; they will also help the student to distinguish between the rendering of purely natural forms and that amount of adaptation necessary to be used in making a design. The oil painter can devote himself to exact copies, for his materials admit of such treatment. The worker in gold and silver can only produce formal suggestions; he wants his work to look like silver or gold, and not to deceive the beholder into thinking he has actual leaves and flowers before him. Applied art must always steer clear of the naturalistic school which became prevalent at one time, and attempted to persuade the public that a jug which was intended to hold a fluid of some kind was in true design if it appeared to to be made of basket-work, or that a vase for holding flowers adroitly balanced upon the head of a stag was other than a grave absurdity. It would be an easy matter to quote numbers of such examples and absurdities of the naturalistic school, but these two will, I think, be a sufficient caution. The designer proceeding to make a study of some particular plant with a view to finding all the beauty, or quaintness, or geometric outlines contained therein, must take note of every detail—the branching of the stalks, the indentation and veining of the leaves, the front and side elevation, and section of the flowers and stem; and if he wish to prove an ideal designer, he should be interested in his work apart from the pecuniary value of his labours. He should not only make a study of the plant as raw material for his own ends, but as a lover of them for the inherent interest derived from their study; he will want to become a botanist, that he may understand the use of the wonderful structures that unfold themselves to his enquiring gaze, for it is only to the loving student that nature reveals her elaborate secrets, and then, and only then, will he become aware of beautiful outlines and delicate traceries which will suggest adaptations in the goldsmith's delicate art of filigree and *repoussée*, or enamel, as the case may be. To give a simple practical illustration of this I have made a drawing of one of the least elaborate Etruscan vases (sketch 4), where a conventional arrangement of a natural form rendered in harmony with the quaint outline of the vase is traceable to that of one of the lilies, or may be the Ranunculus tribe. By the side of it will be found a drawing of the leaf, and the disposition of the stalk and calix of flower of Ranunculus Arvensis, or Corn Crowfoot, also side view and front elevation of flower, the similarity between the applied design and the serration of the natural leaf is very great, and cannot fail, I think, to prove a useful lesson.


No. 5.—Ranunculus Arvensis.


Front Elevation of Flower.


Side View of Flower.

A Nine Hours' Stroll through the Elgin Watch Factory.

ABOUT two years ago I wrote a descriptive letter to the *Trader* of a trip I enjoyed through the Elgin Watch Factory. I did not complete it entirely then, owing to my having to leave Elgin sooner than I expected, but I received a further invitation from Mr. Hunter, the superintendent, and Mr. Corliss, the head watch and model maker, to do so on my next visit. I was in Elgin last week and did not forget the invitation, but instead of simply visiting the departments that I previously missed, Mr. Corliss did me the extreme kindness to spend a whole day showing me entirely through the immense institution, pointing out and describing everything of interest as we went along. I take it for granted that every watchmaker must be deeply interested in everything pertaining to the manufacture and construction of watches, and so, with your permission, I will describe, for the benefit of those interested, what I saw in my trip through the factory.

Imagine a building, or a series of buildings rather, all under the one roof, having a floor space of about 200,000 feet, and 3,000 people, engaged in one way or another in the construction of watches, and you will form an idea of the immensity and importance of this watch factory. If I remember rightly, about $150,000 is paid out in wages every month. A great many of the departments have four rows of benches extending the entire length of the room, and seating between two and three hundred operatives, and I imagine there must be between 75 and 100 miles of belting used to run the different lathes and machines used in the factory.

The construction of the watch begins in the plate room. There the blanks, slightly larger and thicker than the finished plates, are taken in hand; dial and pillar holes punched, plates faced off and made the correct diameter; the different sinks made and the pivot holes drilled, screw holes drilled and tapped, etc. Although not used in the plate room, I might mention here the new automatic pillar machine for making the pillars for 18 size full-plate movements. This machine, which was invented and constructed in the factory, is just being perfected in detail, is very complicated, and cost an immense sum (several thousands of dollars). Heretofore the pillars have been made by a partially automatic machine as follows: A rod of brass wire is fed through a chuck in head stock spindle of machine, a cutter comes into action and faces off the end of the wire, making it the correct length. The circumference is then turned to the correct size and shape by another cutter, and the two ends finished to size, the one to fit the pillar holes in upper plate, and the other to receive the thread by means of which it is attached to the pillar plate. The operator then feeds a screw-plate, arranged in a tail stock spindle, and cuts the thread, and another cutter comes up to place and cuts off the finished pillar; then the chuck opens automatically allowing the wire to be advanced, and again automatically tightens up and the above operation is again repeated. This new machine does the work complete without the assistance of any workman, and does it very rapidly, and the arrangement of the different cams and devices for bringing the different cutters into and out of action is simply wonderful. In the flat steel room where the regulators, clicks, forks, etc., are ground and polished, the system is much the same as pursued in a repair shop, the different parts are cemented to blocks, perhaps 100 in a block, and three of these blocks are attached to a revolving vertical spindle, this spindle is attached to an arm of the machine which has a kind of circular motion, therefore the lines are crossed and a perfect polish assured. The grinding is done on planed iron blocks charged with oil stone dust, then the work is thoroughly cleaned and polished in a similar manner on boxwood charged with Vienna lime. In the department where the train wheels, hands, regulators, etc., are stamped out, there is some very beautiful and expensive machinery. I noticed particularly the wheel stamping machines. The lower die looks exactly like a finished wheel, without the teeth, of course. A strip of brass is fed in on top of the die, and the upper die which exactly fits the spaces goes through the brass, leaving a perfect wheel blank. The blanks are afterwards put in stacks on an upright holder in a machine and the teeth cut with fly cutters.

THE JEWEL DEPARTMENT.

In this department the hole jewels and end stones are fitted in brass settings, ruby pins made, pallet jewels ground, angled, and polished.

The number of jewels carried in stock is enormous. On May 1 the company had in stock 5,000,000 jewels valued at $200,000. They handle from 400,000 to 500,000 per month, and use from $400 to $500 worth of diamond dust per month for the different operations of grinding and polishing, opening, etc.

It is very interesting to follow the different operations for finishing pallet jewels. In the first place about 100 garnet slabs are cemented to a block which is attached to a machine and the slabs are then ground flat and smooth on a diamond lap, which consists of a copper mill charged with diamond dust. After one side is finished, the slabs are reversed and the other side finished. When the four sides are thus finished, the jewels are arranged in a special machine for angling them. About twenty are placed in position in the angling machine and slowly revolve, a diamond lap is placed at the desired angle and revolved against the pallet jewels, and the impulse faces are thus formed. Another lap for polishing, charged with finer diamond dust, is afterwards used. The company used to open the holes to the uniform desired size in their jewels, but now they buy the jewels selected and sized both as regards diameter and holes, and therefore very little opening requires to be done. This change makes it necessary to carry a much larger stock of jewels, but does away with the services of a good many operatives otherwise necessary. There were several girls opening jewels, which operation is accomplished as follows: The jewel is set up in a lathe and rapidly revolved, a very fine steel wire, made by drawing through a sapphire draw plate, is held in a pin vice and being dipped in a paste composed of diamond dust and oil, is inserted in the hole, which is thereby gradually enlarged to the desired size.

THE TRAIN ROOM.

In this room the stem wind wheels and pinions, the train wheels and pinions and the lever scape wheels are cut and finished. I noticed particularly the pinion cutting and polishing machines and the scape wheel cutting machine. I will simply repeat my former description of the pinion cutting machines,—"the pinions are cut in complicated looking machines that are marvels of mechanical ingenuity and skill. They are automatic, and include, I think, five frames for holding pinion blanks, arranged in a circle. There are four operations before the pinion is finished. The pinion blank is brought to position under the first cutter, and has the necessary number of slots cut in it with a saw cutter; it then passes to the next cutter, which forms part of the curve, then to the next one and has the curve finished. The fourth is the final finisher, and corrects any little faults, should there be any. This last operation is almost superfluous, but the company take every precaution and spare no expense to have everything perfect. Of course, after the machine is started, while one pivot is undergoing one operation, three others are also, and the fifth frame is for inserting new blanks, so that the machine is always in operation and no time is lost. There are half-a-dozen of these machines, so that a large number of pinions are finished daily."

After the pinion leaves are cut, the pinions go to the polishers, who insert them in wig-wags, in which they are polished very rapidly by means of oil stone dust and crocus. The plain arbors, pivots, and pivot shoulders are polished in these wig-wags also. They have a to-and-fro motion and move very rapidly over the work, one side of the polisher resting on the part to be polished and the other on a jewel in the same plane. The pinion faces are ground and polished by means of a circular revolving hollow disc, while the pinion is revolved in a chuck. The very finest work is finished in the old-fashioned Swiss manner by hand, holding the polisher in one hand, and revolving the pinion by means of the whalebone bow in the other. The machine for cutting the scape wheels is a beauty and cuts a stack at a time. There are three cutters used to complete the operation, the first of steel, and the other two of sapphire. The first one does the heavy cutting and the others the finishing.

They have a new machine in this department for making and finishing balance staff conical pivots. It has been christened "McGinty," not because it went to the bottom of the sea, but because the workmen wish it would, as it does away with the pivoters' job, which used to be an important one, altogether. Formerly the staff pivots were turned and polished by hand, but now, by means of this wonderful and extremely accurate machine, the pivots are made and polished by revolving laps; one young lady operates the machine, while a workman beside her sets fresh staffs up in wax chucks which she inserts in "McGinty" as fast as he can hand them to her. The pivot is made and polished in a little less than no time, and therefore this one machine takes the place of a good many pivoters. The company are inventing and using so many new automatic labour-saving machines, that in a comparatively short time they will very largely increase their output without increasing the number of workmen. They are now making 1,800 movements per day, 300 more than two years ago, with about the same number of hands. They have 230 machinists at work all the time building watch machinery, and even this number is not sufficient, and they are now engaged building more machinists' lathes, so as to increase their number of machinists.

In the dial room, for instance, several notable improvements have taken place. Dials used to be painted by hand altogether until a process was invented and introduced, called the "transfer process," done by means of electrotypes, from which the letters are transferred to the dials direct. Now they have invented a new machine for sifting the enamel on the copper discs ready for the oven. This machine will prepare 100 dials in twenty seconds. It used to take a man longer than that to do one by spreading the enamel on with a spatula, so it will be perceived that this machine is a wonderful economiser of time and money.

THE GILDING ROOM.

In this room the plates, wheels, etc., are stoned smooth, scratch-brushed, and gilded, the nickel movements are also nickel-plated, which prevents them from tarnishing. Thirty dwts. of pure gold is used per day for gilding watch parts. The damaskeening machines are located somewhere in the neighbourhood of this department, and so I will mention them here. I cannot do more than that, because it would be an utter impossibility for me to accurately describe them. The plate to be damaskeened is fastened in the chuck in head stock, and this head stock is capable of an infinite number of different movements, produced by means of cams, ratchets, etc., the plate is smeared with grinding paste, and ivory discs and points revolved against the plate and the different patterns are thus produced. There are half-a-dozen of these machines, and they are very complicated and expensive.

FINISHING ROOMS.

In these rooms the movements are put together, sprung and set running, and timed and adjusted to heat and cold, position, and isochronism. In finishing B room, adjusting is attended to. The movements are put in the oven, which is heated to 95° and run for sixteen hours, and the result noted, when they are removed to the ice box, which is kept at a temperature of about 40°, and again tested for sixteen hours.

Movements Nos. 72 and 91 are adjusted to run within three seconds total variation in 32 hours, B. W. Raymonds and No. 50 to within six seconds, and H. H. Taylor and G. M. Wheeler to within eight seconds in 32 hours. The material used in movements Nos. 72 and 91 is exquisite, fine gold wheels hand finished, beautiful ruby jewels set in highly finished gold settings, delicate lever forks beautifully hand finished and highly polished. In fact, no skill or expense is spared to make them equal to the finest in the world, and to my own knowledge they rival the celebrated "Jules Jurgensen" Swiss movement, which probably enjoys the reputation for being the finest watch in the world. In finishing B department, they have a very ingenious and expensive arrangement used in testing and adjusting movements as regards different degrees of motive force. It consists of a series of cords and pulleys, having different sizes of weights attached. A toothed barrel is connected with each drum, and the movement is inserted in position so that the barrel comes into action with the centre pinion and drives the movement, when the desired observations are made. I might go on describing for hours, but as I have already taken up more space than I should, I will not trespass further.

ED. BEETON in the Toronto *Trader*.

A History of American Clock-making.

THE principal of the Forsyth School in Philadelphia, Pa., recently wrote to Hiram Camp, president of the New Haven Clock Company, asking for a history of clock-making in Europe and in this country. In reply, Mr. Camp forwarded the following sketch, which we extract from the *Jewelers' Weekly*.

Having been brought up in the town in which Eli Terry and Seth Thomas, who were the most noted American clock-makers, lived, and having been in the business myself over sixty years, I can give from memory a brief history of the business.

The man above all others in his day for the wood clock was Eli Terry, who was born in Connecticut in April, 1772. He commenced making clocks in 1793, and worked until 1800, at which time he employed but two or three men to help him. He had no machinery except compasses, small saws, files, etc., to mark off and saw out the teeth. He would make two or three clocks at a time and then take them across the Hudson River into the new country to sell. This he did two or three times a year. These clocks were simple movements with dials, made to hang up, with the weights dangling below. Mr. Terry worked in this way about twenty-five years, and in that time made comparatively but few clocks. About this time he invented a machine to cut the teeth in the wheels, and began the enormous job of making two hundred clocks. This made a great deal of talk in the town, as it was claimed that Mr. Terry would never live to make so many clocks, and that if he should he could never sell them.

But Mr. Terry soon had many competitors, Daniel Clark, Zenas Cook, William Porter, Mark Leavenworth and Gideon Roberts each made a few clocks and went to New York State to sell them, carrying them on horses. There was a man by the name of Boardman in Bristol, Conn., and also one whose name was Manross, who made movements. Soon after this, I think about 1814, Mr. Terry invented a small mantel clock. This had a case. The dial was 11 × 11 inches, with a tablet 11 × 6 inches. These clocks took well, and Mr. Terry sold to Seth Thomas a shop right to make them for $1,000. This was considered a very large sum, but money was made on the invention.

About 1830 Joseph Ives, of Bristol, Conn., invented a metal clock, making the plates of iron and the wheels of brass. About this time C. Jerome also invented a clock about three feet high, with a bronze front containing a looking-glass. It took well and was a good clock. With the introduction of this clock business increased, so that clock-making was quite a trade, and some clocks were sold at the South as high as $80 and $100. Then a company consisting of C. and L. C. Ives, that made a brass clock invented by Joseph Ives, was organized. There was also a firm known as Case and Birge. Their clocks were chiefly retailed at the South.

In 1835 the Southern people became greatly opposed to Yankee peddlers, and licenses so high that they amounted almost to a prohibition were put upon peddlers, but the Yankees were ready for this, and so packed up parts of clocks and sent them to Richmond, Va., and started the business there, claiming that the word making meant finishing, which was done in Richmond, and so was according to law. This company finally moved to Hamburg, S. C.

Chauncey Jerome in 1842, having previously to this been making brass wheel clocks in large quantities, made a venture of sending a consignment of brass clocks to England. This was laughed at by other clock-makers—this idea of sending clocks where labour was so cheap. They said that they should not interfere with Jerome in that visionary project. The revenue laws of England at that time allowed the owners of property to enter goods at their own prices, but the officers could take the goods by paying cash at an advance of 10 per cent. on the invoice. The first lot was entered at so low a price that the custom house officers took them and paid for the whole lot. Soon a larger lot was sent and invoiced at the same price, and that lot was taken. A third lot was sent immediately, but by the time this lot came John Bull had concluded not to go further into the business, but that he would let the Yankees sell their own clocks.

After this a large quantity of clocks fitted up in New York were sent to England. This trade has been kept up, and a great many of the clocks made since have been shipped to foreign ports.

About 1842 a company was formed at New Haven under the name of the Jerome Manufacturing Company, which afterward included some Waterbury people. At this time the company carried on the business largely, as did also the Seth Thomas Clock Company, of Plymouth; also the E. N. Welch Clock Company, of Forestville; the William L. Gilbert Clock Company, of Winsted; afterward the Ansonia Clock Company, of Ansonia, and at a later period and up to this time the Waterbury Clock Company, of Waterbury. These are all Connecticut corporations. A short time ago the Ansonia Clock Company moved to Brooklyn, N. Y., but the clock-making of the United States, with this exception, has been done almost entirely in the little State of Connecticut.

There was a small concern, Terry and Barnum, which was taken into the Jerome Manufacturing Company—or perhaps I might more properly say that the Jerome Manufacturing Company was taken into that. About 1855 the two companies were united into one; the Jerome Manufacturing Company assumed the debts of the Terry and Barnum Company. Those debts were stated to be $20,000, and Mr. Barnum was to indorse for the Jerome Manufacturing Company. It proved afterward that the debts of the Terry and Barnum Company amounted to much more than stated, and the Jerome Manufacturing Company failed after paying a large amount of the Terry and Barnum paper. There were many people holding the Jerome Manufacturing Company's paper. Mr. Barnum's indorsement was on it, and I think 8 cents on the dollar was realized. This failure was a hard blow. Some of the stockholders lost their all, and one man drowned himself. I add this briefly, as the history of clock-making would be very imperfect without some notice of the great showman, whom so many remember.

After this failure of 1856 the New Haven Clock Company took the factory, since which it has manufactured a great number of clocks—I think the largest number by any one company—some years more than six hundred thousand. There are a number of the old companies still in operation, the Seth Thomas Clock Company, of Thomaston; the Waterbury Clock Company, of Waterbury; the E. N. Welch Manufacturing Company, of Forestville; the William L. Gilbert Clock Company, of Winsted; the Ingraham Company, of Bristol, and the Ansonia Clock Company, now of Brooklyn, N. Y., who are the principal makers at the present time, 1890. I suppose there are made in the United States over two million clocks yearly.

As to the manufacture of clocks in Europe I have not so much knowledge. The fact that clocks have been made there for five hundred or six hundred years is well known, but, as I understand, in an entirely different way from ours, except in Germany during the last few years. The European way, for the most part, was to have the parts made by different persons at their homes, one making wheels, another the pinions and still another the verge.

But in the last ten or fifteen years some young men who came over from Germany and worked in our Connecticut factories learned our way of making clocks, then obtained tools made here, took the tools to Germany and started the business in the Black Forest. They are now making clocks, saving the duties on iron, steel, glass, copper, etc., and hiring their help at half the price that it costs us. I understand that they have three large factories now, yet they have not got all the conveniences. It takes time for that. I have been in the business since April, 1829, more than sixty years, all this time in one establishment, except that the name has been changed, and all this time have been trying to invent labour-saving machinery.

American Custom House Statistics.

WASHINGTON, D.C., August 11.—The Bureau of Statistics of the United States Treasury Department has issued its summary of exports and imports for the twelve months ending June 30, 1890, as compared with corresponding periods in the previous year, which should prove instructive reading to business men on this side. We extract the following pertaining to the jewellery and kindred trades:—

Exports of domestic merchandise for the month ending June 30—Clocks and parts, 1890, $112,396; 1889, $113,471. Watches and parts, 1890, $31,070; 1889, $9,984. Jewellery and manufactures of gold and silver, 1890, $50,120; 1889, $115,713. Plated ware, 1890, $28,802; 1889, $30,752.

Exports of domestic merchandise for the twelve months ending June 30—Clocks and parts, 1890, $1,344,047; 1889, $1,149,289. Watches and parts, 1890, $354,089; 1889, $206,030. Jewellery and manufactures of gold and silver, 1890, $662,759; 1889, $916,264. Plated ware, 1890, $440,417; 1889, $587,163.

Exports of foreign goods for the month ending June 30—Diamonds, rough or uncut, including glaziers' diamonds, 1890, none; 1889, none. Clocks and parts, 1890, $8; 1889, none. Watches and parts, 1890, $1,053; 1889, none. Jewellery and manufactures of gold and silver, 1890, $37; 1889, $1,073. Precious stones and imitations, not set, 1890, none; 1889, $5,000.

Exports of foreign goods for the twelve months ending June 30—Diamonds, rough or uncut, including glaziers' diamonds, 1890, none; 1889, $910. Clocks and parts, 1890, $153; 1889, $2,729. Watches and parts, 1890, $2,446; 1889, $2,666. Jewellery and manufactures of gold and silver, 1890, $5,489; 1889, $9,103. Precious stones and imitations, not set, 1890, $76,471; 1889, $33,509.

Imports of foreign goods for the month ending June 30—Diamonds, rough or uncut, including glaziers' diamonds, 1890, $7,535; 1889, $27,245. Clocks and parts, 1890, $21,567; 1889, $19,495. Watches and parts, 1890, $162,086; 1889, $117,153. Jewellery and manufactures of gold and silver, 1890, $15,850; 1889, $67,775. Precious stones and imitations, not set, 1890, $1,797,019; 1889, $1,095,305.

Imports of foreign goods for the twelve months ending June 30—Diamonds, rough or uncut, including glaziers' diamonds, 1890, $132,853; 1889, $257,505. Clocks and parts, 1890, $439,406; 1889, $420,822. Watches and parts, 1890, $1,674,878; 1889, $1,662,118. Jewellery and manufactures of gold and silver, 1890, $1,361,104; 1889, $1,228,393. Precious stones and imitations, not set, 1890, $12,180,482; 1889, $10,771,633.

These figures indicate a considerable increase in imports and either a decrease or a slight improvement in the several lines of exports, except in clocks and watches and parts.

Robbery from Hull Jewellers.—Francis James Longhorn got four months last month for stealing cash and jewellery to the value of £60 from his employers, Messrs. Barnett and Scott, Whitefriargate, Hull.

As Others See Us.

TECHNICAL education in European countries, says *The New York Jewelers' Review*, is as diligently cared for to-day as though it were only now entering upon its primary stages, instead of having been closely allied with the highest degree of skill and inventiveness for the last half-century or more. Perhaps in no branch of industry is this more noticeable than in the manufacture of jewellery, where the supply of young and talented workmen is never at a very low ebb, thanks to the many trade schools and the liberal patronage bestowed upon them by those engaged in the business. England, more than any other of the old-world centres, has reason to feel proud of her mechanical institutions. True, she expends a greater amount of capital on them than all the rest put together, but this is only because she feels satisfied that it is money well invested. Only the other day a deputation from the Birmingham Jewellers' and Silversmiths' Association waited upon the Committee of the Guardians of Wrought Plate for the purpose of presenting a memorial signed by over two hundred of the leading firms of the trade, praying the guardians to make a grant out of the funds of the Assay Office in aid of the equipment of the Technical School in course of construction. The deputation briefly explained the objects of the school and its necessity as a complement to the art education being given to the youth of the trade, and urged the pressing need of money to enable the association to effectively start it in its useful career. In reply, the committee expressed the great pleasure it had afforded them to meet the deputation, inasmuch as the object of the association had their fullest sympathy in the present and best wishes for the future. The chairman of the association was thereupon handed a cheque for £500. In the matter of technical education, therefore, we have yet a good deal to learn, and a leaf from Great Britain's note-book would answer admirably as a first-lesson study.

Methods of Ruby Mining in Burmah.

SIR LEPEL GRIFFIN'S recent visit to the Burmah ruby mines has inspired considerable interest, on account of his description of the different modes of working them, especially as he is understood to have declared that, in his opinion, the expensive and elaborate hydraulic methods are unsuited to them. It will serve a useful purpose to describe the modes of working these mines before the present company acquired them, and fortunately for this purpose there exists the authentic and copious information based on official surveys and reports. The Indian Government on annexing Upper Burmah was naturally extremely anxious to ascertain the precise value of the ruby mines, which had formed a considerable portion of the revenue of the Kings of Ava and Mandalay, and accordingly made elaborate surveys.

The ruby mines, as at present defined, may be considered as limited to the four valleys of Mogok, Say Boo, Kathey, and Kyatpyen, and although they cover a nominal extent of 50 square miles (10 by 5), the well defined areas where ruby mines are known to have been actually worked are included in a total space of less than 5 square miles. The remaining space, although not worked in the past, is considered likely to prove not less prolific of rubies than that part which has been already explored by the natives.

Although they might be further sub-divided, there were two principal methods of native mining—one adapted to the plains and the other to the hillsides. In the former the byon, or ruby earth, lies at a depth of from 3 to 20 feet, and in the latter the operations of the natives have been restricted to the clay in the fissures of the rocks.

Fortunately, these mining operations can be carried on to the greatest advantage at different seasons of the year, the dry season being the most favourable for working the byon in the plain, and the wet, when water is more abundant, for acting on the lodes in the rocks. Working on the lodes can be carried on during the wet season with little or no interruption.

Experience has shown, strangely enough, that while common stones are abundant in the byon, the larger and more valuable have generally been discovered under greater engineering difficulties in the lodes. These have only been worked by the natives in the soft clay which fills up the fissures of the rocks, and one of the first suggestions made for the improved working of the mines was to establish a way, or working, through the rocks in proximity to some formerly productive fissure.

Should a profitable lode be reached it would be easy to sink the necessary shafts or to establish drifts. For these operations only the simplest appliances, in the shape of drills, jumpers, and dynamite work by hand labour, are requisite. With sufficient water power, which is rarely deficient, compressed air machinery and diamond drills can be used. In one important point the native workmen were extremely deficient. They neither understood nor could they supply artificial ventilation, and a large number of mines have evidently been abandoned, not because they are exhausted, but because the miners were stopped by accumulations of carbonic acid or oxide gases.

In working the byon in the plain it is essential that the supply of water should be copious, continuous, and well regulated. Under native management the supply was provided in open aqueducts, and these are, of course, antiquated, and will have to give place to wrought or cast iron pipes. On the supply of water depends the substitution of true hydraulic mining for the crude systems hitherto in use among the Burmese.

The success of the mining operations in the past has arisen from their simplicity, and probably it will not be very different in the future. In dealing with the byon in the valley very likely no method will work better, or prove more remunerative, than the removal of the crust of earth covering the byon, and then carrying the byon itself to the washing house, and this operation might be continued over successive plots until every inch of ruby bearing gravel had been extracted.

This mode of working the byon evidently applies to that which is nearest the surface. Much of the byon lies at a depth which can only be made accessible by regular mining operations; but it is desirable from every point of view that the productiveness of these mines should be made evident without avoidable delay.

How Ceylon's Treasures are found.

RATNAPURA, the city of gems, is the centre of a district 20 or 30 miles square, in almost all of which a stratum of gravel 6 feet to 20 feet under the surface exists. Throughout this area gem-pits are to be seen near the villages, some being worked now, others being abandoned. The natives work there in companies of six or eight and pay a rupee per man per month for the privilege of working a certain allotment, where they begin by marking off a square of about ten feet.

After removing about three feet of soil the sounding rod, a piece of iron about half-an-inch in diameter and six feet long, is used to sound for the gravel. If successful the digging is begun in earnest till about four feet deep. On the second day gravel is taken out by baskets handed from one man to another till all within the square is excavated. Should the miners find the soil fairly firm at the bottom of the pit, they tunnel all around for about two feet, drawing out the gravel, and sending it up also to be heaped with the rest, which usually completes the work of the second day, a watchman remaining near it all night.

On the third day the gravel is all washed in wicker baskets by a circular jerking motion, which throws out all the surplus light stone and rubbish till a good quantity of heavy gravel is left in the bottom, which is carefully examined. There is hardly a basketful that does not contain some gems of inferior value, which are usually sold by the pound for about nine rupees.

Should no valuable stones be found another pit is sunk, and so on until one or two or perhaps three really valuable gems are unearthed, when the work is stopped and the whole party goes off to Ratnapura with the prizes. If these are worth, say a few thousand rupees, they are kept secret and only shown to one or two men of money, who make the owners an advance and look after the custody of the precious stones.

Then the miners gamble and drink for some time, till another advance becomes necessary, and so on until half the value is obtained. Then the party, with the mortgagee, proceeds to Colombo, or Italutara, where rich Moorish traders are summoned to purchase, and the gems soon find their way to London. The general public knows nothing about these transactions, and valuable gems are never heard of in Ceylon and scarcely see the light of day until they reach Bond Street.

The natives have a great fear of exposing their finds till they are sold, and they have superstitious ideas about showing them. This system has been in vogue for centuries. It is only occasionally one hears of a native having enterprise enough to dig a few feet below the first gravel to see if a second bed of gravel is within reach, for they fear the expense of baling out water, which increases as the greater depth is attained, although the second gravel is well known to be much richer than the first.

Modern Jewellery Fashions.

ALMOST barbaric in their rich splendour are the laces and passementeries designed for the trimming of dinner dresses, tea gowns, and reception frocks, which primarily are very plain, though of the handsomest material. The very latest idea, according to "A Woman's Notes" in *Vanity Fair*, is to closely embroider the lace with silk and jewels, and mainly with jewels of colour; though pearls, of course, are employed with effect, principally on bridal gowns or the ball dresses of débutantes. The effect of a pale wild rose bengaline dinner dress, made with a train, and in front the tablier, which has been revived recently, bound with broad silk lace, closely encrusted with pink topaz, is really splendid; while the bodice, with its full sleeves of pink chiffon and chemisette of the same beneath a corselet and shoulder-straps of bengaline, softens down what might otherwise be a somewhat over-striking toilette. The blue turquoise is also to be highly favoured, and so comes as a pleasant change after its long seclusion. A lovely ivory silk gown made for an afternoon "at home," and worn by the hostess, was at once unique and becoming to her beauty, in which the vivid blue eyes of the North mingled with the clear pale complexion and the soft dark hair of the South. It had a plain full under-dress, with a high old-fashioned waist; the edge of the skirt was turned up with silk guipure, outlined as to pattern with turquoise stones; and there was worn with this quaint conceit a loose jacket—such as Sarah Bernhardt introduced into "La Tosca" some years ago—edged all round with turquoise studded lace, and with sleeves of silk guipure one mass of the same cerulean blue jewels. A fillet of silver and turquoise bound together the knotted dusky locks, and vied in colour with the sweet blue of her eyes.

In Paris, where women know how to make the best of their good points, from a course of study which they never neglect, the colour of the eyes is considered, when a toilette is designed, quite as much as that of the hair or complexion. By a dextrous touch of red, dark orbs become in effect darker and more dark still; of grey, the contrast between this and the eyes inclined to violet makes them violet; while the blue of the forget-me-not in the little bonnet supplies meaning to the beseeching "windows of the soul" beneath. We Englishwomen rely far too implicitly upon the national prestige accorded to us for our beauty, freshness, and fine complexions, and consequently lose by a thousandfold the effect gained by the Frenchwomen. We fancy we look well in anything, and oftentimes commit an artistic crime in donning that which, by all the canons of good taste, is what we should avoid. In short, we plan a pretty gown, in which our faces and figures are unknown quantities; they plan a pretty, or rather piquant, toilette, in which their faces and figures form an important part.

Nor are they slavish. How often we hear the expression, pink is my colour, or red; or I never can wear yellow; or grey is deadly on me. Once having decided which, pink is worn to the exclusion of every other tint, red is done to satiety, yellow and grey are as though they were not! Your Frenchwoman rules the colours and makes them play into her hands. We are not so subtly wise. But jewels are introduced still further into the wardrobes of the wealthy. Some of the loveliest fabrics, such as rich silk and duchesse, are embroidered to a foot's depth in handsome dados of flowers, whereon every petal is a set of sparkling stones, every dewdrop a pure crystal. A regular cornfield on rosy silk, yellow wheat, and regal red poppy, the rare pale marguerite, the blue cornflower, studded with stones, is magnificent, and yet so delicately done, and coloured with such refinement of taste, as to be perfectly acceptable and pleasing to the eye. Another in lightest lilac was embroidered with pale pink orchids, powdered with crystal, and looked as fine and lovely as one imagines the rich robes of the Queen of Sheba to have been, or those of the King's daughter whose raiment was of wrought gold. Women have ever emphasised the most striking difference that exists between them and the lower animals of the same sex, ignoring altogether the maxims deduced from a comparison between their brilliancy and the homespun appearance of the barn-door hen, or the little brown nightingale.

Curiosities in Earrings.

THE following article under the above heading originally appeared in the *Globe*, since when it has been "cribbed" without acknowledgment by several American papers, and has, later, been reproduced in *Invention*, by whom it is wrongly credited to the American *Manufacturing Jeweller*, of Rhode Island. The subject is, nevertheless, doubtless of sufficient interest to many of our readers for us to publish the article without apology:—

During all ages the strange fashion of mutilating and adorning the human ear has been practised, and has been in vogue all over the world. It has especially enjoyed great favour among the Orientals, and by Persians, Babylonians, Lydians, Lybians, and Carthagenians the earring was worn as commonly by men as by women. A picture in Thomas Hope's *Costume of the Ancients* shows how the monarchs of Phrygia adorned themselves, and there are numerous evidences in gems, etc., to bear out the assertion concerning the vanity of the antique male. In the *Iliad* Juno is represented as adorning herself with earrings made with three drops representing mulberries, and most of the jewels so worn at that time seem to have come under the head of what some old-fashioned people still call "eardrops." From this period down to the latest the practice prevailed in Greece, and one finds the ears of the Venus de Medici to be pierced for the reception of earrings. Pliny says there was no part of dress on which greater expense was lavished among the Romans, and Seneca mentions an earring which he says was worth a patrimony. It had four pearls, two above and two below the precious stone in the centre.

Antique Designs.

In the more valuable of the antique earrings pearls were almost always used; and they were valued for the completeness of their form as well as for their whiteness. In place of a ring the ornament was often attached to the ear with a hook, a custom which still prevails in Italy. Many Egyptian earrings of beautiful design have been preserved. These antique designs have, says the *Manufacturing Jeweller*, been frequently imitated in modern times, and if the use of this ornament is to be continued it can scarcely assume a more graceful form than was often given to it by the ancients. A small earring, found in the "Masterpieces of the Centennial Exhibition," where it was shown among the Castellani antiques, is about two inches long, the pair representing the dolphins which were emblematic of Venus. The eyes, fins, and other details of the figure are executed in the professional materials of the jeweller's art, instead of by engraving or moulding, that is to say, they are sketched upon the smooth surface by lines of rope-work applied and soldered on. The minute gold cords, of which this rope-work consists, so delicate yet so even, and so firmly soldered as to become homogeneous with the body of the object, constitute the grand technical superiority of antique jewellery. The date of this object is assigned at 350 B.C., the place of its discovery being Tarentum, in Calabria. Another earring is also of the nature of a votive offering to Venus, the design being that of two doves. It was discovered in Etruria, and dating probably to the fifth century. It is of gold and enamel, the national colours being most faithfully reproduced on the plumage.

Earrings of the Ancient Britons.

That the earring was used in Britain during the bronze period has been proved by Dr. John Evans. In a barrow at Cowlam, in Yorkshire, touching the temporal bones, he says, which were stained green by the contact, were two earrings of bronze. They were made by beating one end of a piece of bronze flat and forming the other into a pen-shaped termination. The pen had been passed through the lobe of the ear and then bent round, the other and flat end being bent over it. Thus the earring must have been permanently fixed in the ear. One earring of this class, about eight inches long, was taken out of a stone cyst at Orton, in Morayshire, Scotland. In this case, however, the earring, or rather the ear-trough, was of gold, and might have been worn by some unsubdued Celt who caused the Roman many an unhappy quarter-of-an-hour in his home. Earrings of silver have also been found in the British barrows or burial mounds, but both in England and on the Continent, after the commencement of the tenth century, the fashion appears to have declined, and earrings are neither found in graves nor discernible in paintings or sculpture. M. Viollet Cedric observes that the style of headdress and wearing the hair may in some measure account for this. In the thirteenth century, however, the fashion evidently revived, mention being made of earrings in the *Roman de la Rose*, but there is no graphic description of their form, and neither monument nor miniature is found to assist us. In the sixteenth century earrings were in high favour except among the purists, who denounced the "women who were not ashamed to make holes in their ears whereat they hang rings and other jewels of gold and precious stones." Elizabeth revived the antique love for pearls, and wore "rich drops," two large ones with a third depending from them being seen in her portrait by Zucchero. Continual mention of them is made by writers in the seventeenth century, at which period they were given as love tokens. They were also worn by men at the same period all over Europe. George Villiers, Duke of Buckingham, wore diamond earrings, and all courtiers wore either gold, stones, or pearls in their ears. Men are not seen wearing them after the restoration of Charles II., but there was a singular fashion existing at the same time on the Continent, which found its way to England about the time of James I.—viz., the wearing of two or three strings of black silk.

Savage Customs.

The noble red man who once ranged through the forest primeval was not content with a simple pair of earrings, but tied his ears up in thongs of stained skin. This species of fantastic ear decoration is, however, simplicity itself compared to that practised by certain uncivilised nations in other parts of the world. Take, for instance, the Kaffir, whose ears are pierced at a very early age, and the hole continuously enlarged until it is capacious enough to hold a snuff box, an ivory knob, or a lion's tusk. But the most noted people of the world for slashing and distorting the ear are the Dyaks of Borneo. The lobes are pierced when the child is only six months old, and from that day the hole is forcibly increased in size till it forms a loop from one to four inches, or even more, long. At first wooden pegs are placed in the hole; these are afterwards replaced by a couple of tin or brass rings, while if the Dyak belle cannot afford such luxuries she will take a leaf and roll it up and insert it in her ear. Gradually the weight is increased by the addition of other larger rings till the lobe often gives way and splits. Carl Bock, in his book on *The Head Hunters of Borneo*, asserts that he has counted as many as sixteen rings in a single ear, each of them the size of a dollar. The rings are generally made of tin, and cut so that they can be removed at pleasure.

Jewels are Non-conductors.

LADIES who are fortunate enough to possess valuable jewels need not be in the slightest degree alarmed by the report of the death at Berlin of a young girl, who, while standing at an open window in her bridal attire, waiting for her bridegroom to take her to church, was struck by a flash of lightning and killed. The report boldly says that the lightning was attracted by the jewels on her neck—a statement which, a contemporary very properly says, it need hardly be said, is an utterly absurd one. Lightning often follows a draught, and it has frequently been pointed out that in a thunderstorm the most dangerous position that can be selected is at an open window, especially when the door of the apartment is also open. The unfortunate girl was killed because she was standing in such a position, and the fact that there were trinkets round her neck had no influence whatever in the matter. The idea that they had doubtless arose from the fact that they were fused by the action of the lightning; and it is, indeed, a matter of frequent occurrence in the case of persons struck with lightning that money in their pockets, metal ornaments, and iron on their boots, are wholly or partially fused, although it has never been very satisfactorily explained why this should be the case, since the action of electricity is more violent when passing through a substance which offers considerable resistance than it is when passing through a good conductor. Ladies, however, caught in a storm need not take off their trinkets or empty their pockets in order to add to their safety, for they will gain nothing by so doing. Small pieces of metal such as trinkets or money can in no conceivable way exercise any attraction to a flash of lightning.

Diamonds.

IT is difficult to imagine, says a contemporary, what the writers of sensational novels would do if there were no diamonds. Rubies and other stones may be as valuable, or nearly as valuable, as diamonds; but in the popular imagination they are merely pretty ornaments, playthings, whereas the diamond represents concentrated wealth. A great robbery in a novel is sure to be a diamond robbery; nothing else seems important and splendid enough for the purpose. These stones seem to have a fascination that is all their own. They cannot, in the opinion of many people, match the opal, the sapphire, or the ruby in point of beauty: but their imperial flash seems to strike the mind more forcibly than loveliness of colour. Women—most women, at all events, prefer them to all other gems. It is said that Walpole, whose creed was that every man had his price, once declared that he never knew a woman over whom gold had no power, except one, and she—took diamonds. However great a libel on the sex this may be (says the *Standard*), the saying illustrates the fact that diamonds seem to have a charm for women which no other substance possesses. One might have supposed that if science ever discovered a way of imitating diamonds, their value would have declined: but it is not so. Only an expert, it is said, can tell paste diamonds from genuine stones without a careful examination; many a paste jewel glitters far better, at least, than a badly cut diamond. Yet this king of precious stones keeps its place, for the simple reason that nobody in society dares to wear the imitation trinkets. They are used only by those who are indifferent to the fact that everybody knows that their jewels are sham ones, and by adventurers who are passing themselves off for people of distinction. If a lady wore trinkets of an apparent value far beyond her means nobody would believe that they were real. The fear of being laughed at in secret probably restrains many who would not naturally be averse to making a fine display on false pretences ; and people of this class, when they do buy sham jewels, seem to be unable to confine themselves to paste articles of a size small enough to be readily believed in. If true diamonds as hard as natural ones could be made by a chemical process—a secret which seems attainable, and which yet seems to elude persistently the arts of the experimental chemist—then, indeed, diamonds would cease to be valuable. They would become common, and all their brilliance could not save them from sinking into neglect.

The inhabitants of Kimberley boast that the small area of territory in which they live produces more wealth than any other spot on the globe. This may be true, if we understand by wealth exchangeable value ; and if so, it is in spite of the fact that South African or "Cape" brilliants are decidedly inferior to those stones which come from Brazil. The well-known yellow tinge depreciates them in the market; but they are often found of good size, the largest reaching nearly 300 carats in weight. A small Cape stone is worth very little. A really fine brilliant weighing only 1 carat (the 138th part of an ounce avoirdupois) is worth £12 ; whereas an African diamond, weighing three, four, or even five carats, may be bought for forty or fifty shillings. The value of a brilliant increases in proportion to the weight, according to a fixed rule, viz., multiply the value of one carat by the square of the number of carats. Thus, if the quality of the stone is such that it is worth £7 per carat, the value of a brilliant weighing, when cut, four carats, would be £112 ; but this rule cannot be applied to very large jewels. A fine diamond must not only be of good size ; it must be pure in colour and free from flaws. In estimating the value of a brilliant, much depends, also, on the degree of skill which has been bestowed upon cutting it. There may be hundreds of facets on a single gem ; and if one of them is cut too large the diamond is considered to be spoiled. Formerly, diamond-polishing was entirely, as it still is to a large extent, in the hands of Dutch Jews. The old method of cutting was to fix two diamonds in cement and cause them to be rubbed one against the other till a facet was produced. Modern diamond cutters use powerful engines which drive a steel disc at an enormous rate of speed. On the disc a small quantity of diamond dust is placed by the help of a drop or two of oil ; this dust and the minute particles which are cut from the diamond enter the microscopic irregularities in the surface of the metal, and constitute a polishing substance hard enough to cut the gem to the required shape. Upon the revolving disc the diamond, fixed in metal cement, is pressed by means of a powerful lever. The improved machinery of late years has enabled experts to cut stones in two or three months which formerly could not have been finished in less than two years. It is, of course, one great aim of the diamond-cutter to reduce the weight of the stone as little as possible ; but he is seldom able to perfect a diamond without reducing its weight by nearly one-half. The gem "Star of the South," perhaps the finest gem in the world, was reduced by cutting from 254 carats weight to 125.

There are several diamonds which have histories. Most famous of all, perhaps, is Queen Victoria's Koh-i-Noor, the "Mountain of Light," as its owner, Dadir Shah, christened it in 1739. This stone, magnificent as it still is, is a mere fraction of the size it once was. Its original weight is said to have been nearly 800 carats, or 5¾oz avoirdupois. It was reduced by cutting, first to 280 carats, then to 186, and finally to 106, its present weight. If the stone has lost enormously in weight by the last of these operations, which was performed since it came into Her Majesty's possession, it has gained very much in brilliancy. It is not by any means the largest gem of its kind in the world ; but it is more beautiful than any other, except the "Star of Light." Its pedigree goes back to the very thickest of the "mists of antiquity ;" for tradition tells us that it was worn by a certain Indian hero named Karna, some 5,000 years ago. In 1526 A.D. we find it in the keeping of Baber, the founder of the Mogul dynasty ; and it passed from one potentate to another, until, on the annexation of the Punjaub, it fell into the possession of the East India Company, who presented it to the Queen. But there are remarkable diamonds besides the Koh-i-noor. The "Orloff" jewel is nearly twice as large as the "Mountain of Light" since its last cutting. It is "rose-cut," shaped like the half of a pigeon's egg ; and its place is in the sceptre of the Czar. It is named after the title which was bestowed upon the lucky man who brought it to the Russian sovereign, as part of the price of the jewel. A more substantial reward was a sum equivalent to £90,000 sterling, which was paid to Count Orloff. The stone which once flashed in the hilt of Napoleon's sword was also larger than the Koh-i-Noor is now, as it weighed, when cut, 136 carats. Its weight before it was cut was 410 carats, or very nearly three ounces avoirdupois. It is still known as the Pitt Diamond. Mr. Pitt, the Governor of Madras, bought it for £20,000. He paid £3,000 for having it cut, and finally sold it to the King of France (Louis XV.) for the enormous sum of £130,000. There are several other stones worth large sums of money. Thus the Hope blue diamond is said to be worth £25,000, and a Russian gem of a red tinge is supposed to be worth £15,000, though it weighs only ten carats. No person living in ordinary modern fashion could afford to own diamonds of this value. They would offer an irresistible attraction to thieves. Diamond robbers can afford to wait, for the spoil is so rich that it amply compensates for a large expenditure both in trouble and in patience. Manbreuil, it is said, waited no less than seven years for a chance of stealing the diamonds of the Queen of Westphalia, which were estimated at £80,000 sterling. This young man was aide-de-camp to Jerome Bonaparte, the Queen's husband, and in the troublous times of 1814 Manbreuil found his opportunity. Pretending to have an order for the arrest of Her Majesty, he seized the jewels he had so long coveted and decamped. Some of the brilliants were discovered at Manbreuil's apartments ; some were afterwards found in the Seine ; but the larger part of the treasure was never recovered.

I. D. B.'s and the Cape Diamond Mines.

ACCORDING to the latest news from Cape Colony, the authorities have achieved an important success by the capture of a large party of miscreants whose crime is one of which we have no conception in this country, and which could only exist in a few parts of the world. Where, however, circumstances are favourable to its development, it is easy to understand that it is regarded with the greatest antipathy by the recognised guardians of order, and that all those whom it robs—and they are locally a numerous body—go so far as to assert that "lynching is not too bad for those who are aiding and abetting 'boys' and overseers to steal their employers' goods." "Boys," it may be explained, means Kaffirs, and this will at once afford a clue to the capture which the Kimberley authorities have made. They have taken a gang consisting of no less than fifteen illicit diamond buyers, and all South Africa is invited to rejoice at the fact. There will no doubt be a great deal of righteous indignation hurled at the culprits by the claimholders, diggers, and shareholders in the various companies, but it would be useless, thinks a contemporary, to disguise the fact that public opinion on the whole—outside Kimberley—is not so entirely opposed to the criminals as might be imagined. At this distance we may recognise that the illicit diamond buyers are essentially dishonest. They are, at any rate, receivers of stolen goods, and, like others in a similar position, they have their dupes in their power and pay what suits them. But their practices tend to enrich almost all classes, and their organisation is perfect. It is notorious that many prosperous men in South Africa began by being "I. D. B.'s"—the hieroglyphic by which illicit diamond buyers are familiarly designated—and found in that unlawful and dishonest trade the money which enabled them to acquire, in some cases, at a later period a fortune in a more legitimate business. The whole of the district around Kimberley is, in fact, permeated with diamond trading. Gems are publicly exposed, and pass from hand to hand in a manner which astonishes a stranger who is at all acquainted with their value; and this state of things is due simply to the difficulties with which the law has surrounded the sale of a stone. In spite, however, of all precautions, it is a fact that illicit diamond buying prevails to an enormous extent. A diamond, it must be remembered, is not only valuable; it is small. Concealment is easy, and Kaffirs have been known to swallow one or to hide it in a fold of skin purposely produced by keeping a wound open. There is, in truth, scarcely any limit to the ingenuity which is displayed in concealing stones, and the detective police of Kimberley, which has just achieved so great a success, is, it is not too much to say, mainly occupied in defeating the machinations of diamond thieves and receivers.

Some years ago a local paper suggested that "the digging for diamonds should be done by those who are the owners of the claim; and maybe the illicit diamond buying is only the natural outcome of men wishing to be rich without the trouble of working for money." Diamond seeking is, it must be confessed, more or less of a gamble, though in notable cases it has been found extremely profitable. No one can say where a stone is to be found, or when one may come to light; but this is a defect, if it be one, which applies to all mining enterprises, and the results of diamond hunting in South Africa are sufficient to place it on the level of a reputable industry. It is some twenty-three years since the first Cape diamond was found on a farm not far from Hopetown. At least, it was at that period that the existence of these precious stones in South Africa first attracted notice. Subsequent investigation showed that diamonds were actually to be found embedded in the walls of houses which had been built of mud taken from a neighbouring pond. This was the origin of the now famous Dutoit's Pan, and obviously the glittering gems must have been visible to any one who had eyes to see them. Apparently, however, the existence of diamonds in South Africa had never been suspected; and it might have remained long undiscovered if it had not been for the acuteness of a traveller who noticed the peculiar brightness of a pebble with which the little daughter of his Boer host was playing. With a vague idea of its value, the traveller suggested that he should buy it, and, after being offered it as a free gift on the ground that it was of too little worth to have any price affixed to it, he at length took it away on the understanding that, if it turned out to be of any value, he was to give his host half the money realised by its sale. Thrown into the street as a joke, and recovered with difficulty, this curious pebble was eventually pronounced to be a genuine diamond, and its discovery acted as the match which lit the train of a new industry. A few small diamonds were speedily brought to light, and then the astounding fact was announced that a diamond of over eighty-three carats had been discovered. This was the "Star of South Africa" afterwards known as the "Dudley" diamond; and since those days we have made acquaintance with the Stewart, the Jagersfontein, the Porter Rhodes, the Tennant, and many others. Diamond seeking has been organised into a regular trade, and one of what must be regarded as its ordinary risks is to be found in a carefully elaborated system of dealing in stolen stones.

Speaking generally—and, of course, there are numerous exceptions to the rule—South African diamonds are a little "off colour." They are not so pure as those which former generations obtained from India, and which, in later times, have come from Brazil. Even those which have been found in recent years in the river drifts of the tertiary formation in Australia are harder and whiter. At the same time not a few perfectly pure-coloured stones have been found in South Africa, as well as some whose defective tint may almost be considered a beauty. Thus Dieulafait, speaking of "the Star of Diamonds," which seemed to spring no one knows whence, and which, it may be surmised, was brought to market under the auspices of the illicit diamond buyers, describes it as "a lovely atom which attracted attention by revealing under the microscope a prospect of pointed mountain crests, lit up by vivid sunlight in all the colours of the rainbow." The "Tennant," too, though of a yellow hue, is said to exceed "in size and brilliancy any diamond in the British Crown." Nor, it must be understood, is it necessary for a diamond to be colourless. Some of the most valuable possess very distinct tints, and are renowned for them. The "Hope" diamond, obtained by Tavernier in India in 1642, and sold to Louis XIV. in 1668, is of a dark blue. It has been described as "d'un beau violet," but this hardly does justice to it. Four other blue diamonds are known, of which one is supposed to have been a fragment cleft from the "Hope," and this tint is, with the exception of ruby red, the rarest of colours met with in diamonds. Of the latter shade, only one perfect specimen is known, and it has been likened to "an African sunset, with light filmy clouds in the north-west." "It feeds your eyes with much pleasure in beholding," as Thomas Nicols wrote to the dons of Cambridge more than three hundred years ago, and it is hardly likely ever to come into the market. It will be news to most people that green diamonds are not absolutely unknown, whilst an English nobleman possesses a very fine black diamond; and other stones exist of pink, lilac, and apricot shades, and are valued for their rarity. It is a noticeable fact, however, that few, if any, diamonds of these unusual tints have been discovered at the Cape. The South African stones are either pure white or slightly yellow, and, in spite of the extent to which illicit traffic in them is carried out, the yield of the mines is likely to make itself felt in the diamond markets of the world for many years to come.

The Retail Shops.

A Holiday Sketch in the North.

TO anyone engaged in the actual production of a given article it is always a matter of great interest to visit the retail establishments where these goods are dispensed to the consumers. More especially is this the case in the jewellery trade, where an occasional glance through the shop windows is not only a pleasure but an education to the maker of the wares there exhibited. Hence, on a recent holiday trip to several of the more fashionable north-country resorts, we loitered round the various displays with some deeper interest than idle curiosity; and we must confess to having been agreeably surprised at the variety and the general excellence of the stocks shown. Especially does this remark apply to shops of second and third-class quality, which show to proportionately far better advantage than do their tip-top neighbours.

Of really first-class goods—diamond and gem work—we did not see a single representative collection. A few mediocre hair ornaments, with a fair selection of smaller expensive goods, bracelets, rings, and earrings, brooches, pendants and breast pins, form a display which would in no wise compare with the best London windows. The reason of this paucity is to be easily understood, and it does not in the least prejudice the characters of the provincial shopkeepers for enterprise or business ability. It is simply a fact that, with very few exceptions, purchasers of this class of article will not buy except in the metropolis. Regent Street or Bond Street are essential factors in suiting the fastidious taste of the buyers of expensive diamonds. Hence the opportunities of selling such articles in the provinces are few and far between; a fact which sufficiently explains their absence from the shop windows.

Of the more ordinary run of good jewellery the displays in many of the shops were extremely satisfactory. Well selected and tastily assorted, they gave evidence of great care and ability on the part of the various managers, and seemed to demand a speedy sale. It is unnecessary, and indeed impossible, to give special reference to all the various articles exhibited, and it seems somewhat invidious to select any one class for comment. We think, however, we may fairly give individual note to the ladies' gem rings, which, in quality and variety, occupy undoubtedly the most prominent position. We were quite charmed with the displays in this line, and we noticed several really fine stones—diamonds, rubies, and sapphires—which would, we think, well bear critical inspection.

Respecting those shops which bear a cheaper stock and cater for a middle-class trade, we can speak with equal praise. Everywhere we noticed the same effort to please, the same determination to attract custom, and even down to the third and fourth rate strata, where cheap silver and plated goods only hold sway, the same care and attention to business is shown, and the best possible is made of the materials available. And it is a matter of extreme surprise, even to one having some considerable experience of the trade, to notice to what an extent the improvement in design, make, and finish has spread to the cheap, low quality goods.

An increasing section of the retail jewellery trade appears to be the sale of plate-silver and electro—especially small ware—while the multitude of silver-mounted fancy goods (a comparatively recent development) gives a pleasing variety to the stock. Whether the sales from this department are in excess of, or to that extent instead of, a genuine jewellery turnover is a question which the retailer must ask and answer for himself. There certainly seems a tendency, especially on the part of some of the sea-side shops, for the jeweller to degenerate into a mere fancy dealer. We noticed several instances where the bulk of window space was devoted to cheap articles of glass, china, etc., suitable for presents and *souvenirs*. Again we say if this is extra business, so far good; but let the shopkeeper take care, lest, in angling for the small fry, he lose his big fish.

It would presumably be impossible to conclude a sketch of this sort without a grumble, and we have just one matter to which we would call special attention. We saw nothing at all noteworthy in the matter of window dressing. There was just a commonplace spreading of the articles; the chief idea, apparently, being to get as much as possible into view at once. No artistic effort to attract observation was discernible, no effective grouping of pieces or colours, no suggestion of set-off or contrast. All we saw was simply display—lavish, we grant, and sometimes laborious, but after all only display. Let our young and rising shopkeepers give their careful attention to this matter, taking, if need be, a few lessons from their neighbours—the drapers; and they will, we believe, find it greatly to their advantage.

Artificial Gems.

We are not to have "perfect" artificial gems after all, it appears; at any rate not just yet. The chemist whose experiments were recently reported by the *Standard* to have resulted in the production of emeralds disclaims, according to another daily contemporary, any such signal success. Mr. Charles Bryant, of New Bond Street, writes to the *Standard* to explain on behalf of the chemist that the gems in question are easily distinguishable from real stones, and that no alarm need, therefore, be felt lest imitations should creep into the market against which none but experts could have any protection. There should be a great calming of troubled bosoms at this reassuring announcement. There is a certain class of people with whom wealth takes the form of costly gems as readily as if they were Eastern potentates. As their circumstances improve their jewellery increases; it is the outward and visible sign of their prosperity, and they mean it to be so. If the gems they wear are blighted in their reputation by ever so slight a possibility of imposture, jewellery ceases to have any value at all for them. To some degree the whole of society suffers from this mania for gems. What else could account for the frenzied worship of diamonds? The diamond has attractions which need no puffing, and it will always, unless artificial substitutes are discovered, hold its own as a brilliant finish to costly attire; but there are other gems whose colours are a formidable set-off against the sparkle of the diamond, and which, when tastefully arranged, are capable of producing exquisite effects. But it is just this tasteful arrangement which is conspicuously absent in the average jewellery of to-day. So long as the stones are fine, large, and set so as to show well, the purchaser apparently asks no more. Delicate workmanship, skilful combination, and good design are not always considered matters of importance by either buyer or seller, and it is conceivable that a scientific discovery which should destroy the value attached to certain gems might have a beneficial effect upon the jewellers' art.

Hints for Salesmen.

A CONCEITED, pretentious, and affected manner disgusts and repels, while a person whose bearing is simple and natural attracts and makes friends.

There is often less difference between two men than between two moments of the same man. Moods change.

The salesman has to deal with all sorts of people. Some are curious, benevolent, ambitious, vain, opinionated, suspicious, surly, pious, captious, cautious or timid, generous or niggardly, or selfish. Some remember better than they can reason; some reason better than they can imagine, some decide promptly, others are slow and vacillating in reaching a conclusion, and such are apt to be much influenced by what is said to them; others, still, allow no new fact to influence them until they have digested and distributed it over the general sum of previous facts existing in their minds. The peculiarities of purchasers vary also with age and sex, with nationality, and even in different portions of the same country.

Even the best salesman cannot always sell, but if repulsed from the front, he executes a flank movement, and where another would fail he often gains the victory by superior tact, knowledge of human nature, courtesy, patience, or any other honest influence he may bring to bear. Travelling salesmen have been compared to ambassadors; each is a confidential messenger sent out to negotiate, and the same kind of qualities are required by each.

Lord Chesterfield says: "The ambassador should join moderation, dexterity, temper and tact. He should be a man of learning and of the world; a man of books and a man of men; a man of the drawing room and a man of the counting house, a gentleman and a man of business. He should possess quick faculties, and active powers of observation. He should be pleasant and affable in manner, of good humour and good sense. He should know when to yield, or retreat or to advance; when to press his suit strongly, and when gently to insinuate it indirectly. He should know how to unbend and how to uphold his dignity." All this, thinks *Ironmongery*, applies with almost equal force to the salesman.

Some people sneer at the policy of honesty, as if it were a sordid and unworthy estimate of a lofty principle. But in the commercial age most things have more than one standard of value. The best poets and physicians get most money for their work, while they have another reward in what they teach and do. We might perhaps commute the commercial value of a copyright on Shakespeare's words, but their other and higher value—their influence on mankind—is beyond our arithmetic. And such is with honesty. God and his own conscience settle liberally with an honest man, and it is also well paid in our view—the commercial view—paid in cash. For, as sure as taxes, "Honesty is the best policy."

Bear in mind the golden rule, "Do to others as you would have them do to you." You want full measure when you buy, give a full day's work when you sell your time. Don't always drop your tools when the clock strikes, five minutes delay will sometimes save the employer a night of worry.

A German watchmaker in the Black Forest has constructed a clock which he warrants to run without winding until the year 9999. If the buyer does not care to take the watchmaker's word it is suggested that he might give his note and take the clock, to be paid for at the end of that year if the timepiece is still going.

Anecdotes of Rings.

THE value of a ring as a messenger of grace was exemplified in the stormy days of Queen Mary of Scotland. Two burgesses had been condemned to death, but were reprieved at the foot of the gallows by Her Majesty. The messenger was sent in great haste by the Earl of Bothwell, and presented the Queen's ring to the provost's inspection for the safety of their lives. This was considered a sufficient indication of the royal clemency, and the "revival," observes Knox, in his *History of the Reformation in Scotland*, "of an ancient custom practised by Scottish monarchs before the date of the earliest sign-manual on record, when everything in Church and State was represented in types and symbols." Swearing by the ring was a practice in early times. In the *Chronicle of Florence of Worcester* we read (A.D. 876): "And in this same year the army of the Danes in England swore oaths to King Alfred upon the holy ring, which before they would not do to any nation, and they delivered to the King hostages from the most distinguished men in the army that they would speedily depart from his kingdom." Among the early Scandinavian nations it was customary to give additional sanctity to an oath by taking it upon a ring or bracelet smeared with the blood of the sacrifice offered upon the occasion. A singular "memento" ring was worn by Carl Hoffman, for many years chief editor of the *Wiener Tageblatt*, who died some time back at Vienna. Down to his last hour he wore upon the fore-finger of his right hand an iron ring, which, some three decades before, he had made for him out of the link of the chains he had borne as a political prisoner during two long and weary years of incarceration, varied by hard labour. Rings, as we know, were given as prizes at tournaments, athletic sports, such as wrestling, horse and foot races, shooting with the bow, etc., in former times. One of the most singular rewards of this kind was for "grinning" matches.

In connection with wedding-rings may be mentioned the following curious notice in one of the marriage registers of the Church of St. James, Bury St. Edmunds: "1832, November 5th, Christopher Newsam—Charity Morrell; Charity Morrell being entirely without arms, the ring was placed upon the fourth toe of the left foot, and she wrote her name in this register with her right foot." At the marriage of Napoleon I. with the Austrian Archduchess, upon receiving the benediction-ring, he asked, "Why did not the Empress Josephine give me a ring?" The reply was, "Because, sire, it is the custom in France that only the bridegroom gives the ring." "Ah," said Napoleon, "that is good!" and whispered in M. Pradt's ear, "But do you know why the women receive the ring? It is a custom founded on the Roman law, which ordained that all slaves should wear rings: and, as the women are our slaves, they ought to wear this badge of servitude."

An Eye Glass, but no String.—Max O'Rell writes in the Washington *Star:* The young French dandy takes kindly, too, to the single eye glass, which, to be really effective, must now be worn without a string. I do not mean that the string takes away from the virtue of the glass, but it has been decided that it detracts from the stylishness of the elegant aid to vision. An eye glass must not now be an appendage but a part of one's self. The aim is clearly to show that one is so confident of his ability to maintain the glass in position that a string is needless. The great desideratum is to be able to eat with it, ride with it, dance with it, laugh with it, sneeze with it (if you can see with it so much the better), in fact, to look as if you slept with it and found it in its place in the morning. Of course, accidents will happen to the best-regulated eye glasses, and, necessarily, part of the training for wearing a stringless one properly is to learn to pick it up nonchalantly when it does stray away from home, unless you adopt Mr. Whistler's plan. He carries a supply in his waistcoat pocket, and if one deserts him replaces the rambler from this reserve stock.

Coloured Films on Metals.

THE small metallic articles, such as buttons, buckles, clasps, etc., have different coloured films produced on them by various methods. Some of them are known as oxidized silver.

Rainbow colours are produced on brass buttons by stringing them on a copper wire by the eyes, and dipping them in a bath of plumbate of soda, freshly prepared by boiling litharge in caustic soda, and pouring it into a porcelain dish. A linen bag of finely pulverized litharge or hydrated oxide of lead is suspended in the solution, so as to keep up the original strength of the solution. While the buttons are in the solution, they are touched, one after the other, with a platinum wire connected with the positive pole of a battery until the desired colour appears. The galvanic current employed must not be too strong. The colours are more brilliant if they are heated after they have been rinsed and dried.

Coloured films are more conveniently produced upon bright brass by different chemicals, by painting with them, or by immersion. The following examples are given by the *Engineering and Mining Journal*.

Golden Yellow—by dipping in a perfectly neutral solution of acetate of copper.

Dull Grayish Green—repeatedly painting with very dilute solution of chloride of copper.

Purple—heating them hot, and rubbing over with a tuft of cotton saturated with chloride of antimony.

Golden Red—a paste of four parts of prepared chalk and of mosaic gold.

In covering an article with any coloured bronze in powder, it is first rubbed with a very little linseed oil, and the bronze dusted evenly over it from a dust bag. It is afterward heated in an iron pan at about 480 degrees F.

In recent times small articles are also roughened by dipping in strong nitric acid, and, after washing and drying, they are coated with a rapidly drying alcohol varnish, that has been coloured yellow with picric acid, red with fuchsine, purple with methyl violet, or dark blue with an aniline blue. This gives the desired colour, with a beautiful metallic lustre. The latter colours are not very durable, and are for inferior goods.

A Fisherman's Art Carving.

GEORGE HIPWOOD, a fisherman of Gloucester, Mass., has nearly completed a carved jewel box which in execution and design is, according to the *Jewelers' Weekly*, a marvellous piece of workmanship. It has taken four years of his leisure time to complete it, and, when it is considered that most of the work was done on board a fishing boat, the difficulty of the undertaking can be appreciated. It is in no sense a jack knife production but is a work of art.

Mr. Hipwood is a very intelligent man, well versed in modern and mediæval history, and has tried to represent a portion of the latter in the carving. The work stands 15 inches high by 12 inches wide. The box and cover have been cut from two solid pieces of white wood and white oak respectively, and no glue has been used.

The cover of the box is finished to represent the Middle Ages, and is in the form of a Mohammedan mosque surmounted by a dome, with an entrance at each end approached by steps. The alcove at one entrance is finished with a cross representing the triumph of the Christian faith, while at the other an open Koran rests on a stand, emblematical of the Moslem supremacy. Each is surrounded with appropriate carvings. This represents the period when Crusader and Mohammedan alternately captured and recaptured these edifices.

On the front of the cover is a Knight Templar's pavilion, upheld at each end by three spears fastened with ribbons, while on each side is a shield upheld by three swords. On the two front corners are two dragons with flaming eyes, each with one paw resting on the swords, as if challenging to combat. The lower front part is carved to represent a full-blown rose in the centre, surrounded by shells, flowers, and ornamentation of various kinds. At the base is a grotto, in which a swan sits gracefully on a pool of water, surrounded by ferns and aquatic vegetation. The front corners are elegantly finished with oval shaped shell work.

The back part of the cover has carved cornucopias on each corner, with masses of diamonds rolling in profusion from their depths, while in the centre, surrounded by a double setting of fine shell work, is a representation of the Kohinoor diamond, apparently suspended by two fine needles.

The back of the body of the box is carved, according to a systematic plan, with diamonds no two alike, and the back corners are finished in pendant diamonds.

The box is lined with blue silk velvet and is fitted with a hammered silver spring lock, which, unless knowing the ingenious mechanism concealed within, no one can unfasten. When the box is opened two small gold chains arise on each side, and are so finely adjusted that when the cover reaches a perpendicular position it remains at a standstill.

Every part, both above and beneath the carvings, will bear the closest inspection with a magnifying glass. Eight different tools were used, and in doing work beneath some of the carvings it was found necessary to heat the steel of the cutting implement to get around corners.

The work is pronounced by persons who have seen fine carvings a marvel of patience and artistic workmanship. The design, which was originated by Mr. Hipwood, will be copyrighted, a photograph of the box having been sent to Washington for that purpose. The box is now being polished, one portion in bright finish and the other, to bring out a contrast, in dull work. The polishing has to be done very carefully. Over one hundred coats of oil have already been applied to the box.

Mechanical Ocular Defects.

Their Nature, Cause, Correction and Relations to Functional Nervous Diseases.

By Dr. C. A. Bucklin.

CONTINUING his further consideration of hyperopia in the *Jewelers' Circular*, Dr. Bucklin says:—The number of ocular symptoms which can arise from the simple cause of a short diameter in the eye-ball will be found to be very numerous and diversified.

The greater number of all forms of asthenopia are due to this one cause. We learn to distinguish at first sight an ordinary case of asthenopia resulting from hyperopia as the following case will illustrate. Miss B., aged 18, has serious asthenopic symptoms. I place a book before her at six inches, and reading becomes difficult; at five inches it becomes impossible. There must be either hyperopia or diminished accommodation. As I look at the other members of the family I see a brother with convergent strabismus. As ninety per cent. at least of all persons having converging squint are hyperopic, and hyperopia if found in a family usually exists in several of its members, confirms me in the belief that the individual is hyperopic. She complains that she cannot persevere with her work. Upon using her eyes she has a disagreeable feeling above them; upon closing the eyes for a moment this disagreeable sensation passes off, but only for a short time. She states that at a distance she can see well. After a long rest she can continue her work better. She sees well through convex fourteen at a distance. A weaker lens is no better and a stronger one is worse. She states that the trouble commenced after a fever. She has always had the hyperopia, and her accommodation which was weakened by the fever, could no longer cover it. She was given convex fourteens to work with and cautioned not to try out her eyes very severely at first, and avoid night work for a time till she recovered her power of accommodation. She was entirely free from all trouble in a week.

The question now arises, should this young woman wear these glasses continually or how much should she wear them. There are many sides to this question which the sufferer cannot, without some instruction, settle for herself.

Some people work to the limit of their power of accommodation, covering their hyperopia during distant vision. The ciliary muscle is therefore constantly in a state of fatigue, and they will tire at the reading distance although they wear their glasses. This class of persons require assistance for distant vision in order that they may not become too fatigued for practical near vision. Other persons do not become fatigued in overcoming their hyperopia for distant vision; these people can use their glasses for reading only and can read without fatigue or annoyance. By careful questioning, the optician can usually come to a conclusion whether the patient will find it beneficial to use his glasses constantly or not. Those who tire during the distant visual act will always be too fatigued to do near work comfortably although they have proper near glasses.

The above described cases fairly illustrate what I have designated as border cases of hyperopia.

Asthenopia resulting from hyperopia is frequently the cause of despondency and melancholia, as the following case illustrates. Mr. B., aged 50, complains that he is gradually going blind; he has noticed that his sight for the last twenty years has been leaving him much faster than is usual with other persons of his age. He has felt for years that each successive year would be the last that his eyes could hold out. He can remember that as a child he read with difficulty, frequently lost his place on the line he was reading, and was considered a bad reader. While a student his eyes annoyed him greatly, and he was obliged to learn more from hearing than by study. He always lived in fear that any work he did with his eyes would hasten his blindness. This prevented him from concentrating his mind on any definite object. The fear of blindness had also prevented his forming a matrimonial alliance upon which he believed his happiness for life depended. He had consulted an optician in whom he had faith, and who on the ground of common sense had given him convex lenses, which in some degree relieved his trouble, but they had been taken away from him by the first oculist consulted as dangerous because of their great strength. Upon actual test this man could see distinctly at a distance through $+ \frac{1}{7}$.

The above illustrates a class of cases which everyone must in time meet.

A paralysis of accommodation may make an amount of hyperopia annoying, which otherwise would not have been troublesome, as the following case illustrates. In the ten-year-old son of a physician, the father observes has enlarged pupils and he is not able to read even in the morning. Paralysis of accommodation was rejected as a possible cause, because the boy could not see at a distance. Some lurking affection of the optic nerves or brain was suspected. The pupils would not show the slightest reaction to light. The supposition that the boy has paralysis of the accommodation is supported, but the reason why he does not see at a distance is not explained till it was demonstrated that convex twelve gave him distinct distant vision, while convex six enabled him to read. Upon the ground of the above facts, all suspicions regarding a diseased condition of the optic nerve or retina can be dismissed.

It is sometimes very difficult to distinguish between the asthenopia arising from hyperopia and that arising from paresis of accommodation in young persons. A boy of fourteen complains that for some time he has not been able to read. His general health is poor; he looks pale and sickly. The pupils move well. He feels weak, not having recovered his strength after an attack of sore throat, which was evidently diphtheria. Acuteness of distant vision is good. Neither convex or concave glasses are accepted. His near point of distinct vision is at nine inches; it should be at three inches. He can only see at nine inches for a few minutes, and this can only be done by a spasmodic effort.

From ordinary asthenopia resulting from hyperopia the condition is distinguished by its rapid appearance about two weeks after an attack of diphtheria. The easy distant vision. The difficult near vision and the absolute rejection of convex lenses during distant vision.

Muscular asthenopia is frequently associated with hyperopia. This class of cases are very troublesome. Having corrected the hyperopia, they still complain of asthenopia. Setting the lenses close with a very small distance between the optical centres, will sometimes relieve the difficulty. Again we are obliged to resort to prisms with the bases in, joined to convex lenses, for the purpose of assisting weak internal muscles. Tenotomy of an external rectus is also a method of obviating difficulties of this kind. It should be remembered that persons afflicted with absolute hyperopia are usually considered near-sighted. Children thus afflicted will always select the brightest possible light, a fact alone which should make one suspicious that they are not near-sighted. The supposed myopia of this class of persons usually requires very strong *convex* lenses. In our next we will take up the consideration of convergent strabismus as a symptom of relative hyperopia.

This article is followed by the annexed question and answer under the heading

"CORRESPONDENCE."

No. 1.—I have a customer who has a peculiar trouble with the eyes; what is called conical cornea, which comes to a point in the centre of the cornea. It is clear, and you would not notice it unless you examined the eye; can see out each side of the eye, but cannot look straight ahead and see. What can be done, and is there any lens that will help vision? Awaiting an early reply,

I remain,

W. T. LANE.

This letter leads us to the consideration of a very troublesome disease, conical cornea. The middle fibres of the cornea atrophy and this allows the cornea without any perceptible inflammatory changes to bulge forward in the shape of a cone. The apex of the cone may be central or it may be eccentric. When the condition is advanced the peculiar light reflex from a conical cornea is so large and bright that it cannot fail to attract the attention of the most careless observer. At an earlier stage the trouble may escape the notice of a very careful observer if examined by simple inspection. The refractive disturbances are very great at all stages of this deformity. With a dilated pupil the retinal reflex obtained with an ophthalmoscopic mirror will show this deformity clearly in its most incipient stages. It also shows plainly the exact position of the apex of the cone. The cone will appear as a dark shadow on the red retinal reflex. When central, the ring of red will appear equally all about the dark shadow. When the apex of the cone is eccentric it will be seen at a glance. It is also possible that the apex of the cone has a certain area of regular spherical surface, under which circumstances the central point will appear bright red, surrounded by a dark shadow.

If by any optical device practical vision can be obtained, this means is to be chosen. If not, careful experiments must be instituted with enlarged pupils and reduced pupils, combined with lenses and all forms of stenopaic apparatus are to be tried for the purpose of determining how much vision can be gained by permanently changing the position of the pupil by an iridectomy. If all these experiments fail to procure vision which is of any use to the patient, then it is legitimate to operate directly on the cornea for the purpose of making it less conical.

The selection of glasses in this class of cases depends on the condition of the apex of the cone. When this is clear the person will see better with very small pupils. The refractive error will be a high degree of myopia or myopic astigmatism, or a combination of the two defects. When the apex of the cone is not clear the person will see better with enlarged pupils, as he is obliged to see over or under the opacities.

In the first class of cases bi-nocular is not practical. The following three cases will illustrate practically these conditions as they occur:

Case 1.—Stenographer 22 years of age, conical cornea both eyes. Apex of cone in both eyes opaque. This patient has practical vision by using two plane lenses with a thick stripe of black varnish drawn over each lens one-fourth of an inch wide in a horizontal direction. The coating of varnish should be very dense. This excludes a certain amount of light from the eyes, and makes it easy to retain a slightly dilated pupil. When the individual works he looks down through the clear part of the cornea below the apex, and when he looks at a distance he looks through the clear part of the cornea above the opaque apex. The black varnish also excludes the annoying light which would come through the opaque apex. With these glasses the person had practical vision, and could follow his profession, without them he could do nothing. The case is unique and there is no similar one on record.

Case 2.—Apexes are clear. Find man following his vocation as engineer in large factory with following glasses: Right eye—$\frac{1}{5}$, cylinder axis 180°. Left eye—$\frac{1}{5}$, cylinder axis 90°. With these lenses on he could follow his calling, without them he could do nothing. His fear of losing or breaking them was distressing, as they were the only glasses that he had found through which he could do his work, and he had found them by accident. If anything was held before the left eye, which obstructed the light, the *right* eye, which was the only one with which he could see, would fail him. When both cylinders were placed at 180° his vision failed him.

This man had a clear apex to the cone of his cornea in which myopic astigmatism of $\frac{1}{5}$ existed, with a small pupil he could see with this eye, provided the confused vision of the other eye could be excluded without enlarging the pupil of the seeing eye.

Even a ground glass placed in the trial frame before the non-seeing eye made vision poor, while $-\frac{1}{5}$, axis 90° cylinder before the eye which could not see enabled him to see with the other eye. This lens simply made the vision so bad in one eye that he could see nothing, but it did make the pupil of the seeing eye enlarge by cutting the light down. It could be clearly demonstrated that the right eye was the only seeing eye by placing a card in the line of vision of each eye at some distance from the eye.

Case 3.—There are many cases of conical cornea in which I cannot improve the vision. These cases will all in time attempt, by operative means, to have the form of the cornea changed.

How to Prepare Crocus.

AS commercial crocus does not at all times possess the properties necessary for polishing the different metals, it is advisable, a contemporary thinks, for the consumer to manufacture it himself. The manipulations to effect this are easy. Take pure and the clearest obtainable sulphate of iron (iron vitriol, green vitriol, copperas), heat in an iron pan up to fusion, and permit it to remain over the fire, while constantly stirring it with an iron spatula, until it is thoroughly dry, and drops into a pale yellow powder. This is then triturated in a mortar and sifted, placed in a new crucible, and left in the fire of a smelting furnace or calcined, until no more vapours are evolved. After cooling the powder appears as a handsome red material, which represents the crocus used by gold and silversmiths.

The crocus is found in several colour gradations, from pale red to brown red, blue and violet. The cause of the diversity of its colours is due to the different degrees of heat employed in its manufacture; the darkness of the colour increases with the degree of heat, and its hardness also increases, for which reason a pale red (rouge) is used for gold and silver, while violet, known under the name of "steel red," is employed for polishing steel. Each one of the different kinds of crocus, in order to obtain a favourable result, must be ground as fine as possible, and then washed with water. Three clean glasses are used for the purpose, one of which is filled with water, and a quantity of the crocus is well stirred in with a wooden stick, and left to stand for about one-half minute; the fluid is then carefully decanted from the sediment gathered in the glass into the second; after it has stood in this for about two minutes, the fluid is again poured into the third glass, and left in it for several hours, to permit the complete settling of the powder. The sediment contained in the first glass is useless; that of the second is a crocus of an inferior quality, while that of the third is a crocus of the best grade. It simply requires to dry slowly to be fit for use. It is also advisable to moisten the dried powder with alcohol, and in some iron vessel to ignite it, whereby the last traces of fat contained in it are destroyed.

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

11,496. William Worsley Kent, Manchester, for "Improvements in sleeve links." Dated July 23, 1890.

11,485. William Marillier Benzler, London, for "Improvements in watches and other timekeepers." Dated July 23, 1890.

11,505. John James Royle and Henry Bennett, London, for "A combined night-light and time indicator, also capable of being used as an alarum." Dated July 23, 1890.

11,593. Alfred Julius Boult, a communication from Ov. Pegan, Germany, for "Improvements in safety locks or fastenings for bracelets and the like." Dated July 24, 1890.

11,599. G. Cinquemani, London, for "Improvements in clocks or timekeepers." Dated July 24, 1890.

11,758. Edward Worsley Kent and E. T. Whitelow, Manchester, for "A brooch or jewellery guard." Dated July 28, 1890.

11,937. William Hazlitt, London, for "A new or improved device for carrying articles of daily use, applicable to chatelaines and the like." Dated July 30, 1890.

12,074. Gustave Cornisley and Charles Mairet, London, for "An apparatus for weighing watch or clock balance wheels for the purpose of ascertaining the strength and diameter of the spring necessary to actuate and time the same." Dated August 1, 1890.

12,271. G. M. Evans and F. Vokes, Bristol, for "Improvements in means for automatically winding watches, clocks, and other timekeepers." Dated August 6, 1890.

12,336. G. Kalkbrenner, Glasgow, for "A combined solitaire and holder for cuffs and the like." (Complete specification.) Dated August 7, 1890.

12,342. J. B. Hannay, Glasgow, for "Improvements in obtaining silver and other precious metals from ores, and in apparatus therefor." Dated August 7, 1890.

12,384. R. Bausch, London, for "Improvements in chain bracelets." (Complete specification). Dated August 7, 1890.

12,400. J. Beveridge, London, for "Pearl hardening." Dated August 8, 1890.

12,531. T. Wilcox, Birmingham, for "Mounting gold and silver charms or chain appendages whereby the article is better preserved in wear and improved in appearance." Dated August 11, 1890.

12,544. C. E. Ramspott, London, for "Certain improvements in or pertaining to the construction of clocks and for other purposes." Dated August 11, 1890.

12,647. J. Abraham and F. Munford, Cowes, for "Improvements in solitaires." Dated August 13, 1890.

12,650. E. Alexander, Dundee, for "Watch keys." Dated August 13, 1890.

12,803. F. G. Edwards, London, for "Improved studs and solitaires." Dated August 15, 1890.

12,824. J. Gunther, London, for "Improvements in watch and clock movements." Dated August 15, 1890.

Recent American Patents.

Apparatus for Polishing the edges of Watch Mainsprings. J. Logan	432,755
Buckle. J. Hirschfeld.	433,005
Button. L. J. Maxey.	433,087
Chain Guard for Watch Bows. D. O'Hara.	432,762
Cuff Holder. H. R. Baker.	432,591
Eye Glass. G. W. Schoellar.	433,372
Fountain Pen. W. Van Demark.	433,109
Handle for Cutlery. C. E. Eggleston and J. H. La Fave.	432,991
Jewellery. H. T. Regnell.	433,033
Lathe for Turning Pinion Shafts. D. H. Church.	432,791
Machine for Cutting Dies. H. Thurston.	432,859
Making Compound Ingots. L. Burdon	432,690
Manufacture of Bands, Rings, etc. by Electricity. E. Thomson.	432,656
Manufacture of Compound Ingots. L. Burdon.	432,691
Manufacture of Watch Case Centres. D. O'Hara.	432,761
Manufacture of Watch Balances. P. Perrett.	433,255
Method of forming Finger Rings. W. H. Peckham.	433,578
Micrometer Gauge. L. S. Starratt.	433,311
Mounting Metallic Ornaments on Roughened Surfaces. C. B. Headly.	432,940
Musical Clock. J. Sprangers.	433,220
Penholder. J. C. Palmer.	433,303
Process of Manufacturing Alloys of Metal of the Aluminum Group. G. A. Faurie.	432,698
Repeating Watch. C. Barbezat-Baillot	433,225
Roll for Ornamenting Ring Stock. C. R. Smith.	433,050
Stem Winding and Setting Watch. B. Heidbrink.	433,289
Stem Winding and Setting Watch. T. F. Sheridan-Reissue. No. 11,100; original No.	376,015
Stem Winding Watch. P. Perret.	432,709
Watch Bow Fastener. F. Mink.	433,532
Watch Case. D. O'Hara.	433,693
Watch Key. R. Ueltzen.	432,584
Watchmakers' Tool. J. Salick.	433,218

A printed copy of the specifications and drawing of any patent in the American list, also of any American patent issued since 1866, will be furnished from this office for 2s. 6d. In ordering, please state the number and date of the patent required, and remit to J. Truslove, Office of *The Watchmaker, Jeweller, and Silversmith*, 7, St. Paul's Churchyard, E.C.

The Deeds of Arrangement Act, 1887.

Collings, Thomas John, 5, Black Lion Street, Brighton, jeweller.

Creditors.		£	s.	d.
English Optic Co.	London	10	17	0
Lorendge and Sons	"	72	0	0
Naphare and Co.	"	10	13	0
Ashdown and Co.	Brighton	10	16	9
Tancock, W.	"	10	7	0
Partly-secured Creditor.				
Lennox, G. (Estimated value of security, £7)	Framfield	180	0	0
Preferential Creditor.				
White, William	Brighton	11	5	0

Statement of Affairs.

Liabilities.		£	s.	d.
Unsecured creditors		159	16	10
Partly-secured creditors	£180 0 0			
Estimated value of securities	7 0 0	173	0	0
		332	16	10
Assets.				
Property		60	0	0
Book debts		10	10	11
		70	10	11
Less Preferential Claims		15	4	9
		55	6	2
Deficiency		277	10	8
		332	16	10

Carnelley and Co. (Jarvis Carnelley), Grove Hill, Handsworth, and 2, Caroline Street, Birmingham, electro-plater.

Creditors.		£	s.	d.
Lane, Josiah	Birmingham	10	0	0
Ryland, —	"	23	0	0
Wiggin, H., and Co.	"	25	0	0
Eveson and Co.	"	10	0	0
Harrold and Co.	"	10	0	0
Jenkins and Sons	"	10	0	0
Osler, —	"	10	0	0
Taylor, C.	"	10	0	0
Williams and Son	"	10	3	0
Smith, T.	Weston-super-Mare	250	0	0
Jepson, — (Exors. of)	Wirksworth	115	0	0
Fully-secured Creditor.				
Sambidge, Mrs.	Birmingham	1,691	0	0
Partly-secured Creditors.				
National Provincial Bank of England	Birmingham	1,343	0	0
Preferential Creditors		17	0	0

Biden, Alfred George, 6, Warnford Court, and 107, Hatton Garden, London, diamond broker and stockbrokers' agent.

Creditors.		£	s.	d.
Becher, Herbert	London	750	5	4
Bierdmann, Alfred	"	300	0	0
Brawn, Simou	"	200	0	0
Exchange Telegraph Co.	"	13	2	6
Gethen, Harry E.	"	301	8	0
Harrison, Irving	"	2,625	1	0
Lehmair, Max	"	661	4	6
Mitchell, William	"	120	0	0
Robinson, Peter	"	18	9	0
Thomas, R.	"	70	0	0
Viviau, Gray, and Co.	"	2,117	7	9
Wray and Robey	"	125	0	0
Williams. H. R., and Co.	"	13	7	2
Seymour, W. W.	Chichester	3,838	0	0
Homan, Leonard	Johannesberg	550	0	0
Giles, G. F. L.	Southampton	659	0	0

		£	s.	d.
Holberton and Coalbank	Teddington	42	17	0
Stanford, R.	„	18	0	0
Liabilities on Sheet "D"		3,621	3	1

(Not expected to rank).

Preferential Creditors.

		£	s.	d.
Angel, W. T.	London	33	15	0
Slee, Charles E.	„	15	0	0
Porter, William	Teddington	10	0	0

STATEMENT OF AFFAIRS.

Liabilities.

	£	s.	d.	£	s.	d.
Unsecured creditors				12.424	16	9
Liabilities on sheet "D"	£3,621	3	1			
Preferential creditors	£67	18	4			
Deducted	52	19	6	14	18	10
				12,439	15	7

Assets.

	£	s.	d.	£	s.	d.
Machinery, etc.	£50	0	0	18	17	0
Book debts (good)				34	2	6
Doubtful	£4,044	18	6			
Bad	1,577	3	7			
	£5,622	2	1			
				52	19	6
Less for preferential claims				52	19	6
				0	0	0
Deficiency				12,439	15	7
				12,439	15	7

NOTE.—The Receiving Order in this case was made last October, but the debtor only filed his statement of affairs this month.

Dowler, Thomas William, Trafalgar Road, Moseley; and 94, Great Charles Street, Birmingham, jeweller and metal ornament worker.

Creditors.

		£	s.	d.
Collett, A.	Birmingham	34	0	0
Curtis and Curtis	„	12	7	0
Cooper, T.	„	18	16	0
Clarke, Miss	„	11	0	0
Farmer, E.	„	67	0	0
Graves, T.	„	21	0	0
Haydon, Thomas	„	15	19	0
Hadley, T.	„	22	6	0
Ireland, R.	„	15	11	0
Kemp and Son	„	88	0	0
Kalm, J. B.	„	16	12	0
Lines and Son	„	17	4	0
Pearson, J. R.	„	17	1	0
Wood, H.	„	146	0	0
Hodges, J.	„	10	4	0
Hill, J.	„	10	8	4
Lambley and Co.	„	10	0	0
Merrick, —	„	10	0	0
Phipps and Co.	„	10	0	0
Padmore, A. E.	„	50	0	0
Smith, Rev. —	„	11	13	0
Birmingham and Midland	„	81	14	0
Gillow and Co.	Leith	10	16	0
Liabilities on Sheet "D"		4,234	0	0
Preferential Creditors		62	0	0

Woolley, Frank Harry (late trading as Arthur Woolley and Co.), 28, Victoria Road, now public house manager, Aston Tavern, Aston Lane, Aston-Juxta-Birmingham, jeweller.

Creditors.

		£	s.	d.
Madgin, J.	London	10	0	0
Skipper, D.	„	10	0	0
Gas Co.	„	10	0	0
Butler, A.	Birmingham	57	18	0
Bushell, Charles	„	14	0	0
Cox, W. F.	„	11	8	0
Krinks, A. H.	„	10	0	0
Lester, J.	„	55	0	0
Reynolds Bros.	„	44	0	0
Ward Bros.	„	15	0	0
Dingley, A.	„	10	2	0
Roberts, D.	„	10	12	0
Searls, W. S., and Co.	„	10	0	0
Kirby, S. A.	„	10	0	0
Saunders and Co.	„	10	11	0
Ward, E. S., and Co.	„	10	0	0
Bowles, Arthur	Guildford	10	0	0

Total Estimated Debts—£330.

MIDDLESEX.

Carley, George and Co., 30, Ely Place, E.C. (Partners: James Gent, 11, Coleridge Road, Finsbury Park, and Philip Bettle, 5, St. Wilfred's Road, East Barnet, trading as), watch manufacturers. Trustee, George Norton Read, 49, Queen Victoria Street, E.C. (C.A.) Unsecured Liabilities, £6,860 0s. 4d. Estimated Net Assets, £3,149 4s. 7d. Creditors fully secured, £416 16s. 11d. Deed of Composition dated August 14, 1890; filed August 21, 1890. Deed of assignment upon trust to realize or to carry on business with a view to payment of a composition of 7s. 6d. in the £ (or more) by or before December 31, 1890, in which event, on release of trustee by the creditors, residue of property to be reassigned.

Creditors.

		£	s.	d.
Adams, John	Coventry	279	2	0
Ball, R.	London	178	14	2
Barnard, J. F.	„	19	8	0
Breting, A. and Co.	„	636	10	3
Billon, Calame	Chaux de Fonds	192	0	0
Billon, Humbert	„	32	2	6
Bonhote Freres	Pesaux (Suisse)	127	19	0
Brooks, S. A.	London	18	12	0
Brown, C.	„	20	19	0
Clemence Freres	„	846	15	6
Cohen, Philip	Coventry	33	17	10
Deane, —	London	15	0	0
Drocourt (Marais)	Paris	43	13	0
Farraday and Davey	London	41	18	1
Buret	„	41	1	6
Golay, H.	„	116	5	0
Graizeley, A.	La Ferriere (Suisse)	24	4	4
Harris, J. R.	London	2,258	9	0
Haswell, R. and Sons	„	58	15	0
Heath, Hy.	„	49	0	0
Henry, R. L.	„	51	17	6
Hutchinson, C.	„	24	7	10
Ingle, Cooper and Holmes	„	68	0	0
Jarvis, Mrs.	„	50	0	0
Kew Observatory	Kew	19	16	5
London and Westminster Bank	London	87	10	7
Mayer and Fulda	„	86	4	0
Mercer, T.	St. Albans	66	10	0
Major, Manger and Co.	London	45	11	6
Morrall, J. G.	Coventry	37	3	0
Perrenoud Fils	Chaux de Fonds	41	15	2
Reymond Bros.	Sentier (Suisse)	21	2	0
Tissot and Bonetto	London	34	11	0
Wagner and Gerstley	„	13	9	0
Webber, A.	„	32	0	0
Weill and Co.	„	259	18	6
Wible, J.	Geneva	37	19	6
Williamson, H.	London	30	12	6
Woodman and Sons	„	746	7	4
Read, G. N., Son and Co.	„	278	17	4
Buller, Hutchinson and Co.	„	10	0	0

Gent, James (separate estate). Unsecured Liabilities, £844 11s. 5d. Estimated Net Assets, £410. Creditors fully secured, £732 13s. 5d.

Creditors.

		£	s.	d.
Bruce, Alexander	Manchester	75	0	0
Catling, Chas.	London	156	0	0
Inches, Jas. H.	Edinburgh	618	15	6
Inge and Co.	London	12	0	0
Ingle, Cooper and Holmes	„	19	5	4
Pfeister, A.	Locale (Suisse)	12	0	0
Ronlet, —	„	16	10	0
St. James' Building Society	London	416	19	0
Inches, Jas. H.	Edinburgh	250	0	0

Bettle, Philip (separate estate). Unsecured Liabilities, £516 16s. 9d. Estimated Net Assets, £300.

Creditors.

		£	s.	d.
Barrett, Miss S.	New Barnet	32	1	9
Godson, Dr.	Ealing	17	0	0
Paxon, Miss	London	85	13	1
Read, G. N., Son and Co.	„	50	13	7
Wood, W.	„	56	3	6
Dowling, A.	Basingstoke	250	0	0

Simmons, Walter, 18, Featherstone Buildings, Holborn, and 12, Bernard Street, Russell Square, optician. Unsecured Liabilities, £2,600 2s. Estimated Net Assets, £1,147 19s. 6d. Creditors fully secured, £30. Deed of Composition dated August 12, 1890; filed August 19, 1890. Composition of 7s. 6d. in the £, payable 2s. 6d. in cash and four equal instalments of 1s. 3d. each on December 1, 1890, March 1, 1891, June 1, 1891, and September 1, 1891, the last two payments secured (one creditor for £1,330 agreeing to postpone his claim until after September 1, 1891.)

Creditors.

		£	s.	d.
Baden Clock Company	London	28	0	0
Benfils, Anonneret and Co.	Paris	95	0	0
Graham and Co.	London	31	0	0
Hirsch, Pritchard and Co.	Paris	32	0	0
Hilliard	London	11	0	0
Joseph and Co.	Birmingham	99	0	0
Little and Co., Jas.	London	53	0	0
Ling, E.	„	27	0	0
Mayer and Fulda	„	160	0	0
Markt and Co.	„	15	0	0
Nitsche and Gunther	„	273	0	0
Newman and Son	„	15	0	0
Redfern, Jas.	Birmingham	198	0	0
Rogers, Jas.	„	24	0	0
Simmons, C.	London	15	0	0
Stubbings, O. E.	Nottingham	10	0	0
Wheway, Frances	Birmingham	24	0	0
Wright, E. L.	Manchester	11	0	0
Tuke, W.	London	78	0	0
Simmons, A. E.	„	1,330	0	0

Winterhalder and Co. (Raphael Kirner, trading as), 99, Bishopsgate Street Without, E.C., watchmaker and jeweller. Trustee, Thomas

Ford, 89, Gresham Street, E.C., accountant. Unsecured Liabilities, £1,462 14s. 2d. Estimated Net Assets, £573 12s. 5d. Deed of Composition dated July 24, 1890; filed, July 30, 1890.

Creditors.		£	s.	d.
Atkin Bros.	London	15	0	0
Baume and Co.	„	56	0	0
Chaplin and Sons	„	132	0	0
Conway and Co.	„ (abt.)	85	0	0
Diunier and Co.	„ „	220	0	0
Harburg, Henry and Co.	„ „	22	0	0
Gollanz, R.	„	88	0	0
Hirsch, Pritchard and Co.	„	16	0	0
Jones, E. A.	„	10	0	0
Kirschbaum, I.	„	101	0	0
Little, James and Co.	„	14	0	0
Major, Manger and Co.	„	53	0	0
Mayer, A., and Son	„	18	0	0
Potter, William and Sons	„	29	0	0
Perrier, M. A.	„	29	0	0
Stockall, James John	„	27	0	0
Loval, —	„	20	0	0
Upperton, —	„	14	0	0
Bragg, J. and T.	Birmingham	95	0	0
Skinner, J.	„	170	0	0
Rodges, —	Coventry	14	0	0
Lemaihe and Ch Pierre	Paris	27	0	0
Parnall, W. D.	Sidcup	150	0	0

WARWICK.

Brenholz, Harris Davis, 29, Summer Hill Terrace, Birmingham, jewellers' factor. Trustee, Walter E. Fowkes, 83, Colmore Row, Birmingham, C.A. Unsecured Liabilities, £4,844 5s. 7d. Estimated Net Assets, £2,182 2s. 10d. Creditors fully secured, £63 10s. Composition of 10s. in the £ by five equal instalments at 3, 6, 9, 12, and 15 months from August 1, 1890, the last two payments secured. Deed of Composition dated July 28, 1890; filed August 5, 1890.

Creditors.		£	s.	d.
Michael Bros.	London	97	0	0
Robbins and Appleton	„	335	0	0
Wiell and Harburg	„	199	0	0
Fry, M.	Antwerp	80	0	0
Alldridge, W. C.	Birmingham	12	0	0
Appleby and Co.	„	104	0	0
Allen, J.	„	32	0	0
Ashford, W. H.	„	143	0	0
Brandon Bros.	„	44	0	0
Butler, A.	„	37	0	0
Booth and Son	„	30	0	0
Britton and Sons	„	325	0	0
Brenholz, Mrs.	„	137	0	0
Collins, W. H.	„	57	0	0
Carrington and Gordon	„	14	0	0
Cox Bros.	„	64	0	0
Cox, W. F.	„	36	0	0
Cook, J., and Son	„	65	0	0
Collins, C. H.	„	54	0	0
Cramp, G. E.	„	37	0	0
Clark, William	„	27	0	0
Cole, F. W.	„	57	0	0
Dingley, W. J.	„	10	0	0
Davies, W.	„	27	0	0
Durban and Co.	„	12	0	0
Evans and Sons	„	138	0	0
Fletcher, W. H.	„	30	0	0
Gibbons and Co.	„	39	0	0
Griffiths, James	„	36	0	0
Griffiths, A. G.	„	10	0	0
Glover, J. G.	„	58	0	0
Hazlewood and Sons	„	18	0	0
Hyde and Son	„	112	0	0
Hopwood, Thomas	„	70	0	0
Haseler, W. H.	„	39	0	0
Jackson Bros.	„	66	0	0
Jarvis, R. C.	„	14	0	0
Levetus, E. M.	„	142	0	0
Levy, David	„	62	0	0
Levetus Bros.	„	41	0	0
Leeson, G. K.	„	78	0	0
Lawrence and Payne	„	12	0	0
Lewis's, —	„	18	0	0
Mayell Bros.	„	66	0	0
Oliver, William	„	24	0	0
Perks, Mark	„	55	0	0
Pepper, Payton, and Co.	„	118	0	0
Pearce and Thompson	„	41	0	0
Proctor, W. E.	„	33	0	0
Rogers, J.	„	37	0	0
Sutton, W. J.	„	36	0	0
Sanders Bros. and Greaves	„	78	0	0
Swann, James	„	15	0	0
Thomason, John	„	12	0	0
Tabberner, W.	„	12	0	0
Vale and Son	„	18	0	0
Watson, T.	„	16	0	0
Wright and Hodgkiss	„	287	0	0
Wakefield Bros.	„	28	0	0
Birmingham and Midland Banking Company, Ltd.	„	144	0	0
Ellis, G. H.	Blaenau Festiniog	13	0	0
Antrobus, Alfred	Coventry	84	0	0
Baum, M.	Coventry	50	0	0
Hill, C. J.	„	50	0	0
Hawley and Sons	„	109	0	0
Kuudert, Fritz	Handsworth	125	0	0
Jaques, N.	Switzerland	101	0	0
Cogan, —		98	0	0

Harrower, Alexander Henderson, 123, Vyse Street, Birmingham; and 18, Reservoir Retreat, Edgbaston, wholesale jeweller. Trustee, Henry Walker, 5, Waterloo Street, Birmingham, C.A., with a Committee of Inspection. Unsecured Liabilities, £3,540 9s. 5d. Estimated Net Assets, £2,597 4s. 11d. Creditors fully secured, £95 4s. 6d. Deed of Composition dated August 14, 1890; filed August 19, 1890.

Creditors.		£	s.	d.
Antrobus	Birmingham	119	0	0
Appleby, A., and Co.	„	17	0	0
Abrahall, —	„	90	0	0
Adie and Lovekin	„	23	0	0
Beesley, D.	„	19	0	0
Brown, —	„	17	0	0
Cox Bros.	„	25	0	0
Cook and Son, J.	„	84	0	0
Davenport, J.	„	13	0	0
Ehrmann	London	17	0	0
Fenton, J.	Birmingham	293	0	0
Fridlander, A.	„	26	0	0
Freeman, J. and T. H.	„	23	0	0
Green and Son	„	187	0	0
Hahn, G.	„	36	0	0
Haseler, H. W.	„	38	0	0
Haseler, G. C., and Co.	„	188	0	0
Hyde and Son	„	241	0	0
Hinde Bros.	„	13	0	0
Haseler and Milner	„	222	0	0
Haslewood and Turner	„	52	0	0
Johnstone, G. H., and Co.	„	71	0	0
Loch Demeaux	„	57	0	0
Loach Bros.	„	79	0	0
Male and Jones	„	13	0	0
Paton, T. W.	„	65	0	0
——, C., and Sons	„	223	0	0
Parkes, A. E.	„	190	0	0
Pendleton, W.	„	63	0	0
Rollason Bros.	„	24	0	0
Rabone Bros.	„	82	0	0
Smith Bros.	„	37	0	0
Smith, S. W., and Co.	„	19	0	0
Usher, S.	„	331	0	0
Vale and Sons	„	14	0	0
Westwood, B. W.	„	72	0	0
Whitehouse, G. W.	„	11	0	0
Wainwright, —	„	71	0	0
Wright and Hodgkiss	„	20	0	0
Birmingham and Midland Bank, Limited	„	17	0	0
Paton, C., and Sons	„	40	0	0
Usher, Samuel	„	23	0	0
Birmingham and Midland Bank, Limited	„	100	0	0
Harrower, J.	Aberfeldy	24	0	0

HANTS.

Chapman, Henry James, 101, Commercial Road, Landport, Portsmouth, jeweller. Trustee, Thomas M. Attlee, 8, Newhall Street, Birmingham, C.A. Unsecured Liabilities, £1,823 11s. 10d. Estimated Net Assets, £2,000. Deed of Composition dated August 13, 1890; filed August 15, 1890.

Creditors.		£	s.	d.
Crossley, — (Exors. of)	London	15	0	0
Holland, Aldwinkle, and Slater	„	19	0	0
Jacobs, Alfred, and Co.	„	26	0	0
Hirsch, Pritchard, and Co.	„	14	0	0
Cohen, Cohen, and Co.	„	18	0	0
Light, Edward	„	32	0	0
Potter, W., and Sons	„	22	0	0
Webb and Hudson	„	14	0	0
Harris, Charles S.	„	20	0	0
Bromet, A., and Co.	„	36	0	0
Jones, E. A.	„	20	0	0
National Provincial Bank of England, Limited	Birmingham	21	0	0
Blanckensee, S., and Sons, Limited	„	178	0	0
Manton and Mole	„	54	0	0
Joseph, I., and Sons	„	258	0	0
Adkins, Henry, and Sons	„	176	0	0
Sherwood, John, and Sons	„	40	0	0
Leigh and Co.	„	17	0	0
Feldman, Moses	„	35	0	0
Thomason, John, and Nephews	„	13	0	0
Willis, William	Bournemouth	120	0	0
Capital and Counties	Portsea	67	0	0
Amatt, Alfred	„	24	0	0
Holbrook and Sons	„	24	0	0
Batt, John	Sheffield	21	0	0

STAFFS.

Marshall, Charles, 79, Finch Road, Handsworth, wholesale jeweller. Trustee, Allen Edwards, Bennett's Hill, Birmingham, C.A. Unsecured Liabilities, £1,155 4s. 6d. Estimated Net Assets, £464 14s. 4d. Creditors fully secured, £37. Deed of Composition dated August 11, 1890; filed August 18, 1890.

Creditors.		£	s.	d.
Bowman, —	Carrulıferyns	30	0	0
Booth Brothers	Birmingham	81	3	3
Downing, A.	,,	155	19	5
Davenport, W.	,,	48	17	6
Duncan, R.	Fifeshire	10	0	0
Hazelwood and Sons	Birmingham	220	0	0
Lawrence and Lingard	,,	28	19	0
Levetus Brothers	,,	109	9	10
Marshall and Lachiner	,,	66	6	8
Marsh, —	,,	24	12	0
Macaulay, —	Glasgow	18	0	0
Oliver, W.	Birmingham	40	15	4
Patterson and Slater	,,	22	11	0
Peters, —	,,	25	0	0
Perles, M.	,,	13	10	5
Pearce and Thompson	,,	14	14	6
Robinson and Kenan	,,	23	2	0
Servwright, —	Aberdeen	17	0	0
Spiers, D. and L.	Birmingham	19	13	2
Ward, —	Greenock	25	0	0
Martell, J.	Belfast	22	0	0
Fanny Husband (Rent)	Handsworth	10	12	0
Austin and Co.	Dublin	12	0	0
Birmingham and Midland Bank	Birmingham	42	19	0

WARWICK, STAFFS, AND MIDDLESEX.

Stokes, John Charles, 67, Caroline Street, Birmingham, and 34, Hatton Garden, E.C., and Holyhead Road, Handsworth, jeweller. Trustee, Walter N. Fisher, Waterloo Street, Birmingham, accountant. Unsecured Liabilities, £1,620. Estimated Net Assets, £4,918 16s. 2d. Creditors fully secured, £14,150. Deed of Composition dated August 8, 1890; filed August 14, 1890.

Creditors.		£	s.	d.
Dudley, W. (Trustees of)	Birmingham	8,200	0	0
The Birmingham District and Counties Banking Co., Limited	,,	4,500	0	0
Pointon, Alfred	,,	1,800	0	0
Dinquan, W. H.	,,	150	0	0
Stokes, Joseph	Handsworth	220	0	0
Cope, Hannah	Birmingham	600	0	0
Aston and Sons	,,	250	0	0
Sundry Small Debts		50	0	0

Gazette.

BANKRUPTCY PROCEEDINGS.

Baron, Jane, and Job Hold Baron, Old Curiosity Shop, 13, Sheffield Road, Barnsley, tobacconists, wholesale druggists, seedsmen, jewellers, clothes and general dealers. Receiving Order: July 24.

Baron, Jane, and Job Hold Baron, trading as J. Baron, and as J. H. Baron, Old Curiosity Shop, 13, Sheffield Road, Barnsley, tobacconists, wholesale druggists, seedsmen, jewellers, clothes and general dealers. First meeting: Official Receiver's, Barnsley, August 20 at 11½. Examination: C.C., Barnsley, October 16 at 11½. Adjudication: August 5.

Carnelley, Jarvis, trading as Carnelley and Co., 2, Caroline Street, Birmingham, and Grove Hill, Handsworth, electro-plater. Receiving Order: July 29.

Carnelley, Jarvis, trading as Carnelley and Co., 2, Caroline Street, Birmingham, and Grove Hill, Handsworth, electro-plater. Adjudication: July 30.

Carnelley, Jarvis, trading as Carnelley and Co., 2, Caroline Street, Birmingham, and Grove Hill, Handsworth, electro-plater. First Meeting: 25, Colmore Row, Birmingham, August 26 at 2. Examination: C.C., Birmingham, September 22 at 2.

Charles, Frederick Harry, 19, Church Street, Soho, manufacturing jeweller. Receiving Order: August 8.

Collings, Thomas John, 5, Black Lion Street, Brighton, jeweller. Receiving Order: July 22.

Collings, Thomas John, 5, Black Lion Street, Brighton, jeweller. First Meeting: Official Receiver's, Brighton, August 13 at 12. Examination: Court House, Brighton, August 21 at 11. Adjudication: August 1.

Dowler, Thomas William, 94, Great Charles Street, Birmingham, and Trafalgar Road, Moseley, near Birmingham, jeweller and metal ornament worker. Receiving Order: July 24. Adjudication: July 25.

Dowler, Thomas William, 94, Great Charles Street, Birmingham, and Trafalgar Road, Moseley, near Birmingham, jeweller and metal ornament worker. First meeting: 25, Colmore Row, Birmingham, August 21 at 11. Examination: C.C., Birmingham, September 9 at 2.

Gurton, Frank, late 222, Wandsworth Road, pawnbroker's salesman and draper. Receiving Order: July 24.

Gurton, Frank, late 222, Wandsworth Road, pawnbroker's salesman and draper. First meeting: 24, Railway Approach, London Bridge, August 19 at 10½. Examination: Court House, Wandsworth, August 19 at 12. Adjudication: August 7.

Jacobs, Montague Emanuel, 9, Albert Street, Blaenavon, late Queen Street, Cardiff, formerly Commercial Street, Newport, clothier and fancy dealer, and at present pawnbroker's salesman, but otherwise out of business. Receiving Order and Adjudication: August 16.

Jordan, John, 3, Alfred Street, Warstone Lane, Birmingham, manufacturing jeweller. Receiving Order: August 6.

Jordan, John, 3, Alfred Street, Warstone Lane, Birmingham, manufacturing jeweller. Adjudication: August 14.

Mitschke, Harold, 76, Free Trade Hall, Lynn Street, and 13, South Scarborough Street, West Hartlepool, watchmaker and jeweller. Receiving Order: August 6.

Mitschke, Harold, 76, Free Trade Hall, Lynn Street, and 13, South Scarborough Street, West Hartlepool, watchmaker and jeweller. Adjudication: August 6.

Paul, Charles, Bewsey Chambers, Warrington, and 15, Grosvenor Terrace, Latchford, jeweller. Receiving Order: July 31.

Paul, Charles, Bewsey Chambers, Warrington, and 15, Grosvenor Terrace, Latchford, jeweller. Adjudication: August 13.

Pickworth, James, 18, Hargrave Park Road, Junction Road, Highgate, late 96, Camden Street, Camden Town, St. Pancras, jeweller. First meeting: 33, Carey Street, W.C., August 12 at 1. Examination: 34, Lincoln's Inn Fields, September 2 at 11.

ADMINISTRATION ORDER.

Sagar, Walter, 13, Darwen Street, Blackburn, watchmaker. £45 10s. 8d. Twenty-two creditors. July 14. No. 72.

BANKRUPTCY.

Re JACOB VAN PRAAGH.—The bankrupt, who was a diamond merchant and manufacturing jeweller, trading in Jermyn Street, St. James's, filed his petition in December, and on July 29 applied, before Mr. Registrar Linklater, for his order of discharge. The liabilities amounted to £9,096, and the assets are stated to have realised £167 17s. 8d. According to the Official Receiver's report, the bankrupt began business as a diamond merchant about thirty-two years ago, at 166, Euston Road, in partnership with another, and it was dissolved after three years. The bankrupt has since traded as a diamond merchant and manufacturing jeweller, but latterly only as a diamond merchant. He stated that in 1884 (his own business being a little quiet), he also carried on for a short time the business of a bill discounter, which he stated had resulted in a loss of £500. The Official Receiver reported that the bankrupt had omitted to keep proper books of account, that he had traded after knowing himself to be insolvent, and that he had brought on his bankruptcy by rash and hazardous speculation and unjustifiable extravagance in living. It was reported that he had lost £500 through selling goods by auction, and £400 on the Stock Exchange, and that his household expenditure, since December, 1886, had amounted to £3,147, the rent of his house being £150 a year. Mr. Wildy attended as Official Receiver, Mr. White appeared for opposing creditors, and Mr. H. Montagu on behalf of the bankrupt. The Registrar said he did not see what answer could be made to the Official Receiver's report, with the exception, perhaps, of the charges of unjustifiable extravagance in living and rash and hazardous speculation. He did not think any case had come before him in which the neglect to keep proper books of account had been attended with such mischievous results. The bankrupt had not even kept a cash book, and the Official Receiver had taken great pains to point out in what respects he had failed in his duty to keep books and to show how such neglect had brought about a course of trading which could only be described as reckless. Trading with a knowledge of insolvency was clearly proved, and it savoured somewhat of audacity for a man who had failed so recently to apply for his discharge from over £9,000 of liabilities, when his assets could not produce more than a small fraction in the pound. The bankrupt's course of trading must be discouraged, and his discharge would be suspended for seven years.

Re LIONEL DRUIFF.—This bankrupt, a wholesale and manufacturing optician, trading at 44, Hatton Garden, as "Henry Lawrence," and at 23, Hatton Garden, under the style of "The Society of London Opticians," applied last month for an order of discharge from bankruptcy proceedings instituted upon his own petition on March 8 last. It appeared from the report of the Official Receiver, presented by Mr. C. J. Stewart, that the accounts showed liabilities of £6,706 9s. 4d., and the assets had realised £700, sufficient to pay a dividend of 1s. in the pound. The bankrupt commenced business as an optician in 1874, in partnership with another person, the joint capital of £1,400 being contributed in equal shares. They traded under the name of "Henry Lawrence," and in 1879 the partner retired upon an agreement, by which he was to be paid a weekly sum of £7 so long as the bankrupt carried on the business under the same style as before. The failure was chiefly attributed to the bankrupt's losses and liabilities in connection with certain Stock Exchange speculations entered into during 1889 and the present year; also to bad debts and other minor causes. The offences alleged in the report were imperfect book-keeping, trading with a knowlege of insolvency, and bringing on the bankruptcy by rash and hazardous speculation. It further appeared from the report that the bankrupt commenced to speculate in Stock Exchange securities about 1886 or 1887, and continued to speculate therein to the end of last year, upwards of £13,131 appearing to have been carried over in one fortnight. That the accounts showed a present indebtedness to the extent of £896 in respect of losses sustained by such speculations, and that in addition to that sum the bankrupt had admittedly lost upwards of £1,407 since January 1, 1887, making a total loss of £2,303 since that date. Mr. Emanuel, appearing for Stock Exchange creditors, alleged in addition to the charges made by the Official Receiver, further offences of contracting debts without reasonable expectation of being able to pay them, and a fraudulent breach of trust. Mr. Reed, on behalf of the debtor, called Mr. Lawrence to prove that he was formerly in partnership with the debtor, and was a creditor for a large amount in respect of unpaid instalments under the retiring agreement. He had never pressed the debtor for his money, and would not have proved but for the bankruptcy proceedings. In support of the application, Mr. Reed contended that the additional charges preferred by Mr. Emanuel were absolutely without foundation, and the only matters to be explained were the allegations contained in the Official Receiver's report. He then dealt seriatim with those charges, and urged that even if the offences had been committed they were of such a nature as to be lightly condoned. In giving judgment, Mr. Registrar Giffard held that the offences charged by Mr. Emanuel had not been substantiated, and although the other three allegations contained in the report had not been displaced, they only called for a suspension of twelve months. Order accordingly.

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The
Watchmaker, Jeweller & Silversmith.

EDITED BY D. GLASGOW, JUN.

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CONTENTS.

	PAGE
Editorial	73
General Notes	74
Sheffield Notes. From OUR CORRESPONDENT	75
Midland Jottings	76
Birmingham Jewellers' and Silversmiths' Association	78
Art Education in Birmingham	78
Presentation to Mr. Alderman John Gulson	80
The Market Value of Rubies	80
Japanese Mirrors	81
The New American Silver Bill	82
The Electrolytic Method as applied to Palladium	82
Precious Stones	83
The Crystallography of Gems. By W. J. LEWIS ABBOTT, F.G.S.	88
A Bridge of Agate. By GEORGE F. KUNZ	91
Spoons for Collections	91
The Value of Silver	92
The Care of the Eyes	93
How do you Advertise?	94
Pictures in Watches	94
Applications for Letters Patent	95
The Deeds of Arrangement Act, 1887	95
Correspondence	96

The Watchmaker, Jeweller & Silversmith.

A Monthly Journal devoted to the interests of Watchmakers, Jewellers, Silversmiths, Opticians and kindred traders.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s. payable in advance.

Advertisements.—The rates for advertising will be sent on application. THE WATCHMAKER, JEWELLER AND SILVERSMITH will be found an exceptional medium for advertising. Businesses for Sale, Situations, &c., per insertion, 6d. per line, prepaid.

Address all business communications to the Publishers,

MESSRS. HEYWOOD & CO., LTD.,
The Watchmaker, Jeweller & Silversmith,
68, FLEET STREET, LONDON.

Birmingham Branch: 22, HYLTON STREET.

Agents for New South Wales and Queensland:—
MESSRS. BOSCH, BARTHEL & CO.,
409, George Street, Sydney.

SPECIAL NOTICE.

In consequence of Messrs. Truslove and Shirley having removed their business from the City to the West End, the Watchmaker, Jeweller, and Silversmith will be published for the Proprietors by Messrs. Heywood and Co., Limited, at 68, Fleet Street, E.C., to whom all business communications should in future be addressed.

THE opening of the Art and Technical Schools last month, in Vittoria Street, Birmingham, marks the beginning of a movement that may well prove of national importance, at all events as regards the manufacture of jewellery. It is an event of more than local importance, and should be so regarded by the trade at large. It is naturally looked upon with no inconsiderable pride, locally, and may well be characterised by the local press as a "splendid educational effort." Everyone having a knowledge of the trade knows that English jewellery can hold its own in the markets of the world, in all but one quality, and that is its artistic (some people prefer to say æsthetic) merits. The new Art Schools are going to remedy this deficiency, and we may expect that (the good example being followed by other communities) in future "vulgarity" will not be one of the reproaches that can be truly descriptive of English goldsmiths' work. The Birmingham *Daily Gazette*, in an article commending the inauguration of the schools, says truly that jewellery is no longer worn because of its intrinsic value, and that wearers of both sexes now look closer into the quality of the workmanship that is bestowed upon it; we must, however, take exception to the theory enunciated by our contemporary, that the wearing of sham jewellery by 'Arrys and 'Arriets, who "bespatter their persons with brass and glass," is responsible for past periods of depression in the jewellery trade. We think, rather, that a taste for the wearing of any kind of jewellery is good for trade—a taste for the sham must, as a matter of course, lead to a liking for the real.

In conclusion, we heartily congratulate the Birmingham jewellers upon the successful termination of their enterprise, and trust that both masters and men in the many branches of, or cognate with the trade, will largely avail themselves of the facilities thus afforded them for acquiring the all-essential auxiliaries to their craft.

GENERAL NOTES

Mr. Frederick B. Box informs us that he has sold the important jewellery and watchmaking business of Mr. J. Taylor, of Pontefract, to Mr. W. Horden, of Nottingham. Mr. Taylor has, we understand, retired from business.

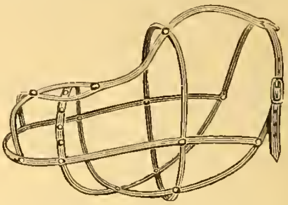
At a meeting of prominent manufacturers of silverware, held in New York city, Wednesday, August 27, it was agreed to advance the price of spoons and forks 10 per cent., in accordance with the late advance in silver bullion. This advance is proportionate with the rise in silver, the price of which will regulate future action. The opinion was generally expressed that silver would rise to par.

Necklaces are seen now with all costumes, says a New York trade journal, "from morn 'til dewy eve." They almost supersede the band of black velvet of long standing, and quite beautiful they are, too. Those of Roman gold beads are particularly neat, but the fine gold chain with turquoises and moonstones, arranged so that the setting is imperceptible, giving the stones the effect of lying carelessly and loose on a fair white neck, are one of the prettiest innovations. Another dainty device shows several strands of fine, twisted gold chains, caught up at intervals by one or more beautiful stones, rubies, pearls and opals combining most richly and giving an elegant ensemble to an evening or ball dress.

A watch factory gentleman paid me a visit, says "Rambler," in *Elgin Every Saturday*, and while in the sanctum his eye caught sight of the advertisement of a jeweller in one of *Every Saturday's* exchanges. The jeweller in question advertised himself as especially well qualified to do repairing and fine work because of having been employed for upwards of eleven years in a leading watch factory. "I've worked for the Elgin company," said my guest, "nearly ten years, and I don't know any more about watch making than I do about millinery." The fact of a man's having devoted eleven years to turning out pivots, or arbors, or wheels, or plates, or screws, doesn't qualify him to dissect watches. The experience of the average factoryite is not a qualification for the horological trade.

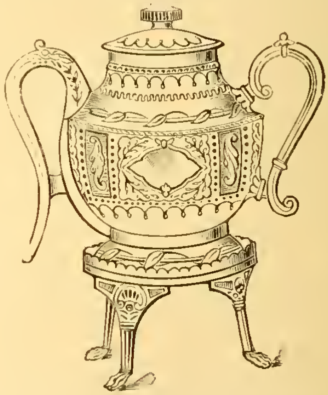
Watches as Compasses.—I was standing (writes Mr. Labouchere in *Truth*) by an American gentleman, when I expressed a wish to know which point was the north. He at once pulled out his watch, looked at it, and pointed to the north. I asked him whether he had a compass attached to his watch. "All watches," he replied, "are compasses." Then he explained to me how this was. Point the hour hand to the sun, and the south is exactly half-way between the hour and the figure XII. on the watch. For instance, suppose that it is four o'clock. Point the hand indicating four to the sun, and II. on the watch is exactly south. Suppose that it is eight o'clock, point the hand indicating eight to the sun, and the figure X. on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing that every one else knew, and happening to meet Mr. Stanley, I asked that eminent traveller whether he was aware of this simple mode of discovering the points of the compass. He said that he had never heard of it. I presume, therefore, that the world is in the same state of ignorance.

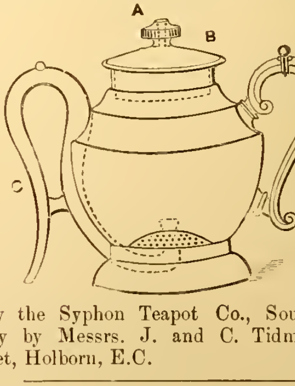
Wanted—A Good Dog Muzzle.—In reference to a paragraph in our Sheffield Notes of last month, Messrs. Garstin and Co. write:—"Your correspondent in Sheffield seems unconscious of the fact that there is a muzzle already in the market which is entirely superseding the old-fashioned and painful strap muzzle.



It is a strong cage-like muzzle, light and durable, and made from one piece of solid leather. It is manufactured by A. Garstin and Co. solely." Messrs. Garstin and Co.'s advertisement appears on another page, and as they manufacture other novelties useful for the trade, the pointer is worthy of attention.

The annexed illustrations show the self-pouring teapot of Mr. R. P. Moncrieff, of South Shields. The sectional illustration makes its construction sufficiently clear as not to require further explanation. The teapots, which we understand are not yet on the market, will shortly be made up in earthenware, Britannia metal, E.P.B.M., and E.P.N.S., and will be supplied wholesale and retail by the Syphon Teapot Co., South Shields, and wholesale only by Messrs. J. and C. Tidmarsh and Co., 4, Furnival Street, Holborn, E.C.

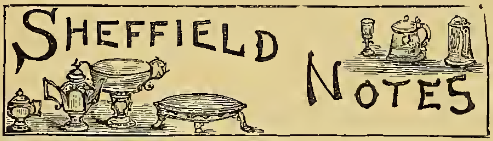




How Mechanics are made now:—The Factory System, an American View.—"The way in which men learn trades in this age of the world," said a man who has made a study of the subject, "is at variance with the way they used to learn. In the old times when a man went to a trade he began and mastered it piece at a time. And by-and-by he could make whatever he was working upon entire. I know a man who works in a watch factory. He has been there eleven years, and all he knows is how to make a balance wheel. Aside from that he knows no more about the mechanism of a watch than a man who never saw one. Another man I know works in a waggon factory. He works on hubs—nothing else. Another man works on spokes, another on the tongue, and so on, but not one of them knows how to put up a waggon as a whole. The result is if one section of the labour in a large factory goes on a strike it throws the whole shop out of balance. What affects a part affects the whole. Labour has made great strides in the last twenty years. This thing of teaching one mechanic one thing and another something else was wisely schemed by somebody. By it, if the plan continues, the mechanic will soon be master of the situation."—*Chicago Tribune*

New York Dudes cannot afford to be Unconventional.—The head of one of the largest firms of jewellers in New York remarked to a *Sun* reporter, the other day, that the fashion of men wearing jewellery, which prevailed for a time, was brief and feeble. Anybody who now wants jewellery especially designed for men, he said, can get quantities of it at any big establishment at a very low cost. Jewellery for gentlemen has been steadily cheapened month after month in the hope of getting rid of it, but there seems to be no combating the fashion, and the tendency of things now is for men to wear little or no jewellery at all. It was thought when the big cravats came in vogue again that there would be a great demand for big scarf-pins, and a great many of them were put on the market; but the swells who wear the biggest scarfs wear the smallest pins, and no man of position in the social or financial world thinks of wearing diamond collar-buttons, diamond finger-rings, or any of the multifarious articles of personal adornment which were formerly so popular. Even the manufacture of jewellery for men, which was at one time a very remunerative branch of the business, has begun to fall off wonderfully. Men of any pretensions to fashion do not now wear watch-chains. They either carry a cheap watch loose in their pockets, or have it attached to a cheap silver key-ring chain, which is buttoned on to the side of the trousers. The severity of fashion regarding jewellery is undoubtedly due to the abuse of the ring craze five or six years ago. A number of wealthy clubmen took up the fashion of wearing two or three rings, many of them decorated with diamonds, rubies, and sapphires, and then the cheap dudes all over town began to imitate them. Every errand-boy wore a silver or gold-washed ring, twisted around his finger four or five times, and the whole fashion reached such gaudy proportions that, within less than a year, men had given up jewellery-wearing entirely. Occasionally a cad will be seen about town who is all blazing with diamonds or gaudy pins, but a gentleman is now distinguished by an entire absence of jewellery of every kind.

How a Woman Uses a Watch.—Perhaps a woman can't sharpen pencils and throw stones in just the orthodox way, but she can take care of a watch exactly to the Queen's taste, and her inventiveness as to the number of absurd and ridiculous ways of wearing it, according to *Woman*, is only equalled by that displayed by man in formulating excuses for going out between the acts or getting in late from the club. Her ministrations begin with winding the watch, which she never thinks of doing unless she is going shopping or on a journey. Then, if she doesn't break the mainspring, she tucks the watch inside of her dress, where the multitudinous hooks and buttons scrape and scratch the case, and where it requires a half-hour's investigation when she wants to see what time it is. At night when she takes her dress off she forgets all about it, of course, and sends it whizzing under the bed or bureau, as she throws back her bodice preparatory to wrestling her way out of it. If it stops she isn't at all disconcerted. With a serenity born of long experience she picks it up and shakes it until it ticks again. After all, it is only the unusually careful woman who wears her watch inside her dress, for the intricate fastenings of the fashionable bodices render it well-nigh impossible. She has the happy fashion of tucking it into the pocket of her cloak or dumping it into the bottom of the bag she carries about with her, or tucking it away, along with half a hundred samples, her latchkeys, and small change in her *portemonnaie*. Jewellers have wise instincts, notice quickly, and cater well to sweet woman's whims. They understand that there is no earthly use in remonstrating with women, and explaining that it is their own fault that their watches never keep accurate time, and are constantly in need of repair. No; they philosophically set about making little purses and card-cases with a separate compartment for the watch, and an aperture in the outside through which the hands may be seen; they put them in bracelets to be clasped about the wrist; they introduce them into the handles of umbrellas; they bury them in the heart of flower petals with a pin at the back, and last of all they have produced the woman's dear delight—the châtelaine. This octopus arrangement of silver or gold pins on at the side, or slides over the belt, or winds girdlewise about her waist, but in any event it keeps the watch swaying and banging against all the other knives, and smelling-bottles, and shears, and things with which she burdens herself in a perfectly delightful way, which is warranted to thwart the purpose of the best disposed timepiece ever manufactured.



SHEFFIELD NOTES

From Our Correspondent.

Mr. Robert Colner may be congratulated on the fact that his feast has been as successful as any of its predecessors. The Cutlers' Feast is generally understood to cost between seven and eight hundred pounds, so that the Master Cutler, who pays the piper, is fully entitled to all the satisfaction he gets from the successful carrying out of his programme. Although a Cabinet Minister was present, perhaps the lion of the evening was General Lord Wolseley, for our robust population is decidedly military in its tastes. For example, I am not sure but what Mr. Bingham is not better known as the popular commanding officer of the Sheffield Engineers than as the successful head of the flourishing firm of Walker and Hall. This reminds me that the silver tea and coffee service presented to Mrs. Colner by her husband's workpeople on the occasion of his elevation to the Master Cutlership was made by this enterprising firm.

In connection with the Cutlers' Feast an interesting document has come to light, being no less than the Master Cutler's bills for his feast of 1790. One hundred years ago the Master of the day was Mr. Joseph Ward, whose descendants still flourish among us as merchants and manufacturers. The bills in question are curious reading. The butcher's bill totals up to £5 6s. 11d., being made up of a number of interesting details. We are told that Mr. Ward got thirty-six sheep's tongues for 6s., and four beasts' tongues for 8s.; that thirty-four pounds of rump beef cost him 12s., and twenty-eight pounds of crop 13s. 8d. But it was in the matter of fowls, geese, and ducks that the Master Cutler of a hundred years ago had the pull of his successor of to-day. Fowls cost him 1s. 9d. to 2s. 6d.; geese, 3s. 6d.; chickens, 1s. 6d.; and ducks, 2s. 6d.—all per pair. Then follows a long catalogue made up of such articles as hams, fish, lobsters, fine pasties, tarts, and so forth, covering an amount of confused eating, showing that the Cutlers' Feast of a hundred years ago was not quite the modest affair we are apt to suppose it.

By the way, what connection is there between St. Bartholomew and the cutlery trade? There is reason to believe that the fact of the Master Cutler being installed each year on the eve of St.

Bartholomew is no mere coincidence. In a certain public school, separated from Sheffield by over a hundred miles, it has been the practice from time immemorial to present each scholar with a knife on St. Bartholomew's Eve. I have never heard any reason assigned for this, and I cannot help thinking that the clergy of the town have missed a grand opportunity of endeavouring to clear the matter up, as this year the Feast of St. Bartholomew fell on a Sunday.

Although, politically speaking, Sheffield is a working-class constituency, yet the eight hours working-day question is not likely to become a burning one here, whatever it may be with the miners outside the town. Among the old staple trades piece work is too generally practised for any compulsory limitation of the hours of labour to become popular. In the silver trade it is sometimes the practice to pay the very highest class of art workmen by the day, but apart from these the rule is piece work. Any contribution, therefore, which we as a community may make to this mischievous agitation will come from trades not distinctively Sheffield trades, and, therefore, from a minority of our working population.

There is something almost Gilbertian in the assertion of Mr. J. T. Cook at the re-union of School of Art students, that "he knew several persons who had been absolutely forced to become picture painters because they positively could not make a living in any other way, although well educated, and might have been a credit to the country as designers or art workmen." We are often enough told that education does not improve a man's morals: it is very sad now to learn that it cannot even prevent him becoming a painter. Mr. Cook, as head master of the Sheffield School of Art, ought to know what he is talking about, consequently, when he calls the love of pictures an unhealthy craze, his opinion must be treated with respect. I am afraid, however, that Mr. Cook goes upon the principle that there is nothing like leather. The right to be of the Sheffield School of Art is doubtless to train men up in the more artistic treatment of the handicrafts of the town. We need not, however, on this account shut up the bowels of our sympathy for other phases of art outside the ornamentation of a teapot or a stove grate.

Every man who has the artistic temperament must feel that in matters of art applied to everyday life, the former days were better than these. Mr. Cook pleads that rich men, instead of covering their walls with inferior pictures, should spend their money in the encouragement of art workmanship. But the days are past when a merchant prince can give a commission to a Benvenuto Cellini for a salt-cellar which shall be the admiration of generations to come. Our system of large manufactories is fatal to all this. Mr. Cook, however, thinks otherwise. Perhaps it is just as well to aim high enough. At any rate, nobody can deny the Sheffield school the merit of sticking to its digging. If it has not produced great painters, we have the satisfaction of reflecting that it was never intended to do so. On the other hand, it has turned out ornamentists of considerable eminence, and above all, it has raised the standard of artistic excellence in the silver trade of the town to as high a pitch as the general public are capable of appreciating.

It is difficult to get at the bottom of the idea which pervades business circles as to the existence of large stores of ivory in the interior of Africa which are working their way by some mysterious process down to the coast. Years ago it was Livingstone, and then it was Stanley, who was bringing the precious stuff to port. But the long-looked-for supplies never came, and yet vague rumours are still circulating as to the fabulous cargo which is to come in and enable manufacturers to replenish their stores. Business men are not imaginative as a rule, but the mystery of the dark continent must have got at even them. In the meantime the various substitutes for ivory are engaging the attention of manufacturers, and a demand is put forth that such shams should be brought within the scope of the Marks Act. It is pointed out that some of them are so like the real article that the public are often deceived. This is especially the case with a certain class of goods sold by auction at night, as by an artificial light even experts have sometimes the greatest difficulty in discriminating the true ivory from the false.

The M'Kinley Tariff Bill has passed, and it now remains to be seen whether Sheffield is to continue to exist, or whether the smoke problem is to be solved by the compulsory adoption of a remedy which shall be worse than the disease. On the whole, I think the manufacturing world will not come to an end just yet. There are really some few parts of this earth, outside the great United States, where the people are sufficiently civilized to use spoons and forks. At any rate, the prospect of having to emigrate to America is too awful to contemplate. Fancy having to read an American newspaper over one's breakfast. It is all very well for Mr. Carnegie to talk about triumphant democracy. He knows very well that the triumph is *his*. The democracy of the States has served his purpose very well, but he knows better than to live beside it more than he can help. On the whole, he is right.

As the St. Leger has been lost and won we are now settling ourselves down to business. From the sad sea waves, from the moon and the stubble fields, men are trooping back to their warehouses and offices. The difficulty of getting away from business this year has, I think, been greater than usual. All that, however, is now over. The gas is lit in the workshops, and the electric light in the show-rooms. The travellers are out and the orders are coming in, and we hope to have our hands full right away up to Christmas. The advertising columns of the daily press seem to indicate that the demand for artisans in the silver trade exceeds the supply. At any rate, employment by competent workmen is not difficult to get.

Midland Jottings.

⁂ ***Correspondence for "Midland Jottings" should be addressed to the Editor at the Birmingham Office, 22, Hylton Street, Birmingham, where it should arrive not later than the 20th of each month.***

There is nothing to grumble at as regards trade in the Midlands; the spell of fine weather during the month has resulted in a slight impetus to business all round, but there are no very marked symptoms either of degeneration or improvement in the jewellery or silversmiths' trades. The fairly steady price of copper is satisfactory, though the uncertainty as to the extent of the stock causes a little anxiety to be felt. It is generally thought that if the price could be got down to about £60 more business might be done, inasmuch as such a price gives a good margin of profit all round. Other metals continue steady, and altogether the Midland trades are benefiting by a steady "run" of work, if not of luck.

A matter which is still creating a large amount of private and public discussion, and which has had a very bad effect on the moral atmosphere of the Midlands, is the case of Ingall, Parsons, Clive, and Company, Limited, the Coffin Furniture Syndicate which was constructed some months ago. Shareholders are loud in their demands and denunciations, and as the capital was a big one and as most of the capitalists of the Midlands are concerned, there is no lack of animated correspondence in the public press. As yet, however, the whole case is not known, while threats of public prosecution are openly made, and a general feeling of insecurity has been generated in consequence. The formation of new companies in this district will receive a distinct check for the time being, however things may turn out in the end.

The chief event of the month in the jewellers' quarter is the opening of the Art and Technical Schools at Vittoria Street by the mayor (Alderman Clayton), on the 18th inst. The ceremony was well attended, and most of the leading firms of Birmingham jewellers were represented. The list of those present included the chairman of the Jewellers' and Silversmiths' Association—Mr. J. M. Banks, Councillor Charles Green, who has done so much to bring the matter before the City Council, G. H. Johnstone, J. Wainwright, H. Westwood, M. Davis, J. Hasler, J. Bragg, C. B. Bragg, H. Davis, B. H. Joseph, W. Best, L. Spiers, P. H. Levi, E. M. Levetus, F. Nathan, G. W. Whitehouse, F. W. Martin, A. G. McKewan, E. R. Taylor (head master of the school of art), E. Preston Hytch (secretary of the school of art), and Allen Edwards (secretary of the Jewellers' and Silversmiths' Association). The mayor opened the proceedings and pointed out the objects and scope of the schools. Alderman Wm. Kenrick, M.P., proposed "that this meeting views with much satisfaction the completion of the Vittoria Street branch of the Birmingham School of Art," and Mr. J. M. Banks seconded the resolution. Mr. E. R. Taylor was called upon to respond. Councillor Green proposed a vote of thanks to the mayor, and in the course of his remarks thanked the City Council for their promptness of action in the matter. Councillor Allen seconded this, which was supported by Mr. Geo. Dixon, M.P.

It was announced in the course of the meeting that several generous promises had been made to the schools. Mr. Augustus A. Fridlander, of Hylton Street, offers £10 per annum for the next three years to be given in money prizes to the students. He suggests it should be apportioned as follows: £5 to be equally divided between the five pupils who have made the best attendance combined with good conduct throughout the session; and £5 in two sums of fifty shillings each to the two pupils who have made the best general progress. Mr. Mark Norton, of Buckingham Street, has made a handsome gift to the school in the form of a set of jewellers' rolls or flatting mills, for reducing the thickness of the metal. This is a perfect specimen of its kind, and is of the newest type with all the most recent improvements. Mr. Henry Davis promised £5 per year for three years, to be awarded by the committee in prizes, and it is hoped that other offers of a similarly generous nature will be made by the trade.

To commemorate the opening of the schools, Mr. J. M. Banks has had printed in an exceedingly tasteful fashion, a four-page oblong card, on which the date of the function is inscribed along with an appropriate Ruskinian quotation. On the third page, in the form of an allegory, Mr. Banks has told the story of the efforts which have been made to introduce the artistic spirit into the manufacture of Birmingham jewellery. Reference is made to Parisian work, and a hope is expressed that Paris may no longer be the fountain of inspiration, but Birmingham, and that Birmingham will lead the way with work which shall outdo all the finest things which Paris is able to produce. Whether the Vittoria Street schools will do this we do not know, but there is the chance, at all events, and if the whole trade of the quarter will but unite and determine it shall, then the thing is practically done. We venture to hope that such a desirable state of things will be accomplished.

Mr. C. J. Adie, of Warstone Lane, Birmingham, has prepared a number of new designs for various useful articles, which will serve to increase the sale of such things. Nothing is more annoying than to see in a shop window or show case, the same old patterns repeated season after season without variation or change, and one can readily understand that pretty, new designs will tempt people to buy who really may not actually want the thing, but who purchase it because they like it.

Mr. Adie's new patterns in electro-plated wares include various arrangements in ruby and colourless glass for sugar and cream cruets, and flat dishes for sugar or butter, in etched ruby, in which the patterns are raised. Another very convenient cruet was in cut glass and electro-plate for cream and sugar, with a cap like a pepper box fitted to the jug-shaped sugar container so that it might be used to sprinkle the pastry or fruit with sugar instead of using a spoon or other server. The small fancy salts in electro-plate and "satin glass" in various colours should have a good sale, for they come very low and are exceedingly pretty, and serve for decorative adjuncts of the dinner table. A glass pickle frame with straight-sided jars, in which a decided improvement has been made, will undoubtedly sell. The stopper, instead of fitting *into* the top of the jar, fits over it, not only adding to the appearance, but also avoiding the messy state which the old stopper always got into the moment it was used. The various pattern pickle frames are now sent out with a rest for the fork of an improved kind, which adds much to their usefulness. A useful thing is found in the champagne bottle-holder, which fits any make of bottle, as the attachment is in the form of a spiral, which works down over the neck in an ingenious way.

Although best cut glass is selling extremely well the trade still keeps well to china, and there are several tasty designs in electro-plate and china of different kinds to be seen. The crimped-top jug and basin for a cream and sugar frame is very pretty, and so is the gold-stippled china used for salad bowls and biscuit boxes. There are several new designs in china biscuits which will have a good sale. China afternoon tea trays with electro-plate rims are having a good run now, and there are several nice patterns.

There is still a good demand for articles in oak and walnut with brass and electro-plate mounts, and dinner gongs of various patterns, figures, plain pillars, lych gates, etc., in brass and oxidised, are going well. A gong, with a humorous turn, is just being brought out by Mr. Adie. It consists of a horizontal bar placed on two bamboo uprights, on which a little curly-headed negro boy is performing. This gymnastic nigger holds the gong below by cords. An oak card box, with brass mounts, in the form of scoring holes for cribbage, will command a market, as will also the oak flagon, with electro-plate mounts and china lining, and two cups for athletic prizes. Among other specialities for prizes may be mentioned electro-plate inkstands with figures of crickcters or golfers, to meet requirements; and the same figures are used on the corners of prize cups. Other new goods include brass trays for visiting and Christmas cards, and other novelties for the coming season.

The arrest of Mr. J. C. Stokes, in Colmore Row, Birmingham, towards the end of September, has caused some amount of discussion in local circles. The arrest was made under an order of attachment granted by Mr. Justice Lawrance, in the Chancery Division of the High Court of Justice. It will be remembered that Mr. Justice Chitty directed Mr. Stokes, as trustee of the estate of the late R. B. Lucy, to pay over the money and render an account of his trusteeship. This he has failed to do, and the order for his arrest, having been applied for in the suit of English *v.* Stokes, was received in Birmingham by the sheriff's officer some days before Mr. Stokes was arrested. On the afternoon on which the arrest was made, however, the officer met Mr. Stokes with a portmanteau on his way to the railway station. It is believed that he intended to leave the country. He was lodged, however, in the County gaol, at Winson Green, where he will be detained during Her Majesty's pleasure.

Josiah Elijah Morton, the watchmaker whom the Coventry magistrates recently sent to prison for three months for fraudulently dealing with watch movements placed in his care for trade purposes, was one of the best known men in Hillfields a few years ago. When the old Conservative Ward Committee was superseded by the "caucus" as at present elected, Morton came to the front, and in No. 10 polling district he wielded a power which told very considerably in favour of his party. His action in reference to politics undoubtedly had something to do with suggesting the formation of the Hillfields Gladstonian Club. He had about him a body of workers whose influence made itself felt in many directions, and it was with the view of counteracting this influence that the Liberal working-men first banded themselves together. A year or two ago Morton left the district, and there is no doubt, the *Coventry Times* thinks, that its Conservatism was weakened by his departure and the breaking up of the coterie by whom he had been surrounded. The offence with which Morton was charged in the police-court was of a most serious character. He had been from time to time entrusted with parts of watches to make up for a Preston manufacturer, but instead of dealing honestly with the materials placed in his hands he seems to have systematically parted with them to raise money. Seeing that the practice had been continued for several months, and that a confiding manufacturer has been robbed of goods of the value of £60 or £80, it cannot be said that Morton's sentence was too severe. The only mitigating circumstance in the whole matter was the help which he gave in tracing the property with which he had been dishonestly dealing.

Birmingham Jewellers' and Silversmiths' Association.

The following is the text of a circular issued to the trade last month by the Birmingham Jewellers' Association:—

14, Bennett's Hill,
Birmingham,
6th September, 1890.

Dear Sirs,

We have much pleasure in announcing the approaching completion of the Municipal School of Art, in Vittoria Street.

It will be remembered that this property was acquired in December last, by the City Council, on the representation of the Jewellers' Association, for the purpose of establishing art instruction in the centre of the jewellers' district on a scale commensurate with the requirements and magnitude of the trade.

The building has undergone all necessary alterations, and has been fitted up in a way which entitles it to rank among the first institutions of its kind in the kingdom.

The formal opening will take place on Thursday, the 18th inst., when his Worship the Mayor has kindly consented to perform the opening ceremony. The City Council, the Principals of Local Educational Institutions, and the Members of the Jewellers' and Silversmiths' Association will also be invited to attend.

The officers and committee of the association confidently appeal to every member (and, indeed, to the whole trade) to make a special effort to start the school with a full complement of students, as in some sense a recognition of the generous assistance which the City Council has rendered to the trade.

The autumn term commences on Monday, the 22nd September.

The fees charged will be 3s. for the autumn and 2s. for the winter term; one-half payable by the association and one-half by the employer, so that the students may attend free.

Hours of Attendance.

In consequence of complaints, both from parents and boys, of the lateness of the hour at which the latter reach home, especially when living at a distance, it was decided by a unanimous resolution at the last general meeting of the association, that the school should be opened at 6.30 and closed at 8 p.m. The museum and school of art committee have been good enough to assent to this arrangement. It is earnestly hoped that employers will grant the indulgence of leaving a little earlier on school nights, in order that punctuality and good attendances may be recorded.

Technical School.

The museum and school of art committee of the City Council have granted the use of a suite of rooms at a rental, to the association, for the purpose of actual practical teaching of the main and subsidiary branches of the jewellery trade, such rooms, and the conduct thereof, to be entirely under the control of the association. It is proposed in the first instance to teach engraving, carving, enamelling, general chasing, and repoussé work, as well as mounting from students' own designs, and from other approved examples. Tool making, necessary to certain of the above branches, will also be taught.

No student will be admitted to the workshop after the first enrolment, who has not passed the prescribed examination in the art school, and every such student will be required to devote one-third of his time (or one evening in three) to continuous study in the art classes. The workshop will be fitted with all modern appliances, and a complete set of tools provided.

Three masters have been engaged to superintend the various branches of instruction.

Lectures will also occasionally be given on special subjects.

Prizes.

In addition to the liberal array of prizes offered by the museum and school of art committee, the association and also private donors will continue their offers for certain excellence in the art school, and it is confidently hoped that arrangements will be made both with the City and Guilds of London Institute and with South Kensington, for grants and certificates of merit for the technical school.

Afternoon Instruction.

The technical school will be open for instruction on three afternoons in the week for young men under the age of 21, at a fee of one guinea per term. No examination required. The evening classes will be strictly reserved for apprentices and young people passed on from the art school. There will be no other means of admission.

In conclusion, the officers again earnestly urge upon every employer to give them his best support to this undertaking, the future benefits from which, to all concerned in the trade, and to the community at large, they think it impossible to over-estimate.

J. MILLWARD BANKS, *Chairman.*
CHAS. GREEN, *Chairman Art Sub.*
J. WILLIAM TONKS, *Hon. Sec.*
P. H. LEVI, *Chairman Tech. Sub.*

The circular was accompanied by an application form for admission to the art classes, etc.

Art Education in Birmingham.

OPENING OF THE NEW TECHNICAL ART SCHOOL FOR JEWELLERY.

THE Branch School of Art in the jewellery quarter of the city, which under the sanction of the Council, the School of Art Committee has established in Vittoria Street, was opened on September 18 by the Mayor. The premises will constitute an admirable suite of class rooms. The principal apartment is 65ft. by 43ft. in floor measurement, and is roofed in three longitudinal bays which light it along its entire length. One of the rooms has been let to the Jewellers' and Silversmiths' Association, for the purpose of technical instruction in those trades, and of this instruction the Association will have sole charge and responsibility, it being, however, provided that only students in the School of Art shall be admitted for technical teaching in the Association room. This room has been fitted up with every requisite for the manufacture of jewellery. The alterations to the premises have been carried out by Messrs. Sapcote and Son, from the plans of Messrs. Martin and Chamberlain. There was a large attendance at the opening ceremony. The Mayor (Alderman Clayton) presided, and there were present Sir Thomas Martineau, Mr. George Dixon, M.P., Alderman Kenrick, M.P. (Chairman of the Museum and School of Art Committee), Alderman Barrow, the Town Clerk (Mr. E. O. Smith; Councillors Lawley Parker, Wallis, C. Green, Jacobs, Hardman, Bradley, Winkles, Barclay, Manton, R. F. Martineau, Osler, Allen (Chairman of the Operative Jewellers' Society); the Rev. W. Greaney; Dr. Alfred Hill; Messrs. G. H. Johnstone, H. Westwood (Assay Office), Whitworth Wallis, J. M. Banks (Chairman of the Birmingham Jewellers' and Silversmiths' Association), E. Preston Hytch (Secretary of the Municipal School of Art), C. J. Woodward, Allen Edwards (Secretary of the Jewellers' and Silversmiths' Association), E. R. Taylor (Head Master of the School of Art), W. H. Coley, F. W. Turton, A. G. McKewan, A. J. Smith, F. W. Martin,

B. H. Joseph, J. A. Langford, J. H. Mole, Walter Best, P. H. Levi, Arnold Wilms, J. Wainwright, W. H. Lord, E. M. Levetus, F. Nathan, G. W. Whitehouse, James Rooker, J. H. Cox, Montagu Davis, Henry Davis, Haseler, John Bragg, C. B. Bragg, John Allday, jun., W. Neale, R. H. Jones, Lionel Spiers, J. Fray, Greathead, Frank Steeley (Master of the Branch School), George H. Ketelly (Assistant Master), Charles W. McKechnie (Teacher of modelling), etc.

The Mayor announced that he had received the following letter from Mr. Augustus Fridlander :—"To commemorate the opening to-morrow of the technical school in connection with the Jewellers' Association, I beg through you to offer £10 per annum to be given in money prizes for the next three years, and which I would suggest should be awarded as follows : £5 to be equally divided between the five pupils who have made the best attendance combined with good conduct during the session, and £5 in two sums of 50s. each to the two pupils who have made the best general progress, the prizes to be adjudicated on by the technical school sub-committee, whom I empower to vary the terms herein mentioned should they deem it advisable. Trusting others in the trade may be induced to follow this example and so create a healthy stimulus amongst our young people." His Worship then gave a history of the movement which resulted in the opening of the school, and pointed to the interest and energy which Councillors C. Green and Jacobs had taken in the matter. He explained that the building could be used at one time for from 200 to 250 scholars, and at present accommodation had been provided for 215. The actual number of students who had entered for the ensuing session would not be known until Saturday. In 1888 the students in the classes numbered 107, and last year they had increased to 155. There seemed, therefore, every prospect that the number in the new school would be quite 200. But it was hoped that they would reach considerably above that number. Mr. Steeley, the head master, had been responsible for the fitting up of the establishment, and he would be assisted in the work of the school by two other masters. The letting of a room in the school to the Jewellers' and Silversmiths' Association was a new, and, he ventured to think, an important feature in connection with the school. The designs done in the art school would be actually executed in the technical school, if good enough. Whatever might be the character of "Brummagem jewellery," yet whatever came out of that school would be known by its right name of "Birmingham jewellery," and would no doubt hold its proper place in the world. There had been some correspondence in the newspapers with regard to the hours during which the school should be open. He understood the arrangements were that it should be open from 6.30 to 8, instead of from 7.30 to 9.15, and he believed the arrangement made would give every satisfaction. He explained the nature of the work which would be done in the school—designing, enamelling, engraving, repoussé, and other work—and said this might be extended indefinitely. Up to the present time only five girls had attended, but it was hoped, with the special aptitude of girls for designing and the special provision made for their convenience, that many more would attend. He ventured to hope that the school would improve the prospects, not only now but for a long time to come, of the Birmingham jewellery trade. They had only to go into the Art Gallery to see how closely England was run by other nations in the manufacture of jewellery and in the art of designing. Those who, like himself, had had the pleasure of travelling a good deal could not but recognise the necessity for high art teaching. Art of a very high character was more and more required if England was to hold her own with her competitors in the east of the world. The magnificent things which he and Councillor Wallis saw in Japan alone was a proof of the innate taste of the Japanese, and that nation alone would run them hard. He hoped in a few years the school would show such results as to prove that the Anglo-Saxon race would be in the van of progress in art in the future.

Alderman Kenrick, M.P., moved "That this meeting views with much satisfaction the completion of the Vittoria Street Birmingham School of Art." Alluding to the connection of the Central School of Art with one of the most important art industries in the city, he remarked that he anticipated nothing but the greatest good both to the school of art and to the trade from that connection. It was a connection which they had laboured for years to bring about, and in the days of the old school with very partial success indeed. But the history of education in England, both artistic and general, had been the history of students' efforts, often failures, but ultimately resulting in great success. For that reason he ventured to hope that, starting as they did with every material arrangement for carrying on education at that school, and with the goodwill and active interest of the jewellers enlisted in the success of the school, it would really be made not only an art school but a really important technical school for the jewellers' and kindred industries. They called the school an experiment, but if it was it seemed to be one that, under proper conditions and management, was certain to succeed. What they wanted was a greater infusion of art into their jewellery than had been the case up to the present time. English jewellery did not want solidity or excellence of workmanship ; he thought in that respect they were superior to all the world. They wanted lightness, delicacy, and fancy added, and then their jewellery would be unsurpassed and unsurpassable. Fancy, delicacy, and refinement were not the gift of all, but if only the gift of the few would influence to an enormous extent the whole of the productions of the city. It was the cultivation of that delicacy and refinement which should be the special feature of that school in connection with the industry of the technical school. They were inaugurating a movement which was capable of very wide extension, but they were beginning in the English prudent way of taking the instruments nearest to their hands which offered the prospect of the greatest and most certain success, so that when they had achieved that success they should be able to take a step further. They wanted to get the practical knowledge of the workshop united with the scientific and artistic knowledge to be found in the art schools.

Mr. J. M. Banks seconded the proposition.

Councillor Jacobs, in support, said they used to follow the foreigner in jewellery designs, but they now hoped the foreigner would follow them. He trusted they would be able to keep the foreign manufacturer away from Birmingham, would supply their own designs, and depend upon their own excellent workmanship.

Mr. E. R. Taylor said he earnestly hoped that the work done in the school might be worthy of the honour done upon it by being opened by the mayor and by the presence of so many gentlemen distinguished beyond the bounds of the city in the cause of art and of technical education. The establishment of the school seemed to him a very natural thing. With regard to science, they might teach the principles before they taught practice, but with regard to art they must begin to teach the handicraft before they said anything about the principles. Every effort would be made by the masters appointed to the school to render it successful.

The resolution was passed.

Mr. Henry Davis stated that he should be willing to give five guineas to the school for three years, leaving it to the committee to distribute it as they thought proper.

Councillor C. Green moved a vote of thanks to the mayor for presiding. He said he should like to say how the Jewellers' Association thanked the City Council for its generosity in voting them so large a sum of money for the establishment of the school. That day marked a new epoch. They would of necessity raise the intellectual standard of the trade by passing boys through that school. By establishing the school they established a school of jewellery, and would make themselves independent of Paris, Vienna, or London. He expressed the hope that employers would do all they could to promote the success of the school, and would endeavour to abolish the system in operation in the past of not letting the workmen know too much. Instead of men being taught to make only one part of an article they would be taught to make the whole.

Councillor Allen seconded the motion.

Mr. George Dixon, M.P., also spoke. He said he was entirely outside that movement, not merely because he was not a manufacturer of jewellery, but because he had had no part whatever in the movement. But there was no one, he thought, in Birmingham, who was more delighted at what they were going to do than he was. As chairman of the School Board he might well say that the Board could turn out multitudes of children who had passed the sixth standard who never would have been at school but for the Education Act of 1870. He believed, however, no one was more thoroughly aware of the fact than the Board that the elementary schools merely laid the foundation upon which others were afterwards to build. If they stopped at the sixth standard they had not done one tenth of the work they intended to do and were trying to do. It was a remarkable thing that, while the House of Commons had been trying to pass a Technical Education Act, they in Birmingham had actually done that which would carry out their hopes and their designs to the utmost extent. If the workmen were more enlightened, they would find, what the masters already acknowledged, that the interests of the two were identical, and that they could not do anything which would benefit the one without equally benefiting the other. He looked forward with absolute certainty to the success of the movement; he had no doubt whatever about it. He very much esteemed the City Council in the course they had taken. They had taken a noble part in the work of artistic education, and he trusted before long they would have to be thanked equally for what they had done in reference to scientific education. On behalf of the School Board he wished them the most complete success, and he felt certain they would attain it.

The resolution was put and carried, and the Mayor having briefly replied, the proceedings terminated.

Casket and Address from the City of Coventry to Mr. Alderman John Gulson, August, 1890.

THE address from the ancient city to Mr. Gulson in acknowledgment of his generous gift of the new buildings of the Free Library has been engrossed on a roll of vellum richly illuminated in mediæval style, the decoration including a medallion of the city arms and also a view of the Free Library buildings. The scroll is headed by an ivory roller, having at one end the elephant and castle badge of the city, and at the other the monogram of the donor whose benefaction it records. At foot is attached by a silk ribbon the seal of the city itself. The roll when closed is held in the box by two silver supports, which allow the seal to lie at foot upon the silk cushion without injury.

The box is ebony, of oblong form, with rich mouldings, silver panels, and mountings. At the corners are four decorated pilasters, while projecting panels, obverse and reverse, bear leading enamel decorations. The lid rises by appropriate gradations to the long oval dome, upon which a floreated monogram "J. G.," in carved silver, rises and surmounts the whole. The silver dome is richly chased—two ribands, one bearing the words "Free Library," the other "1890," indicating the object of the piece. The side surfaces are devoted to civic emblems and cognisances, the arms and crest of Coventry; the Prince of Wales' plumes and motto being arranged with the maces and swords of the city insignia. The leading panel on the obverse of the casket itself is occupied with the arms, crest, and motto of Coventry, enamelled in colours of the correct heraldic blazon upon a silver background, against which it produces a charming effect.

The reverse panel has also in enamel the monogram of the mayor for the time being, with the civic coronet above it. The larger divisions of the longer sides of casket are occupied with enamelled miniature paintings framed in silver, of buildings with which Mr. Gulson has been personally identified or which have profited by his benefactions. First comes the view of the Free Library buildings, and in the other division of the front of box appears the city School of Art. On the reverse part is shown the St. Mary's Hall, scene of much of Mr. Gulson's public life, and as a companion picture the adjacent church of St. Michael with its glorious tower and spire.

The two ends of casket are also adorned with symbols relating to the interest taken by Mr. Gulson in public movements. One of these is the badge of the local volunteer battalion, accurately carved, wrought, and enamelled, although on so reduced a scale. The other is a medallion representing the Coventry Ragged School, the poor boy comfortably dressed and seated at his studies in the centre sufficiently explaining its purport which the name on the surrounding garter emphasises. In addition to the eight main panels already described there are eight subsidiary silver panels on the corner pilasters of the casket, each having reference to the subject in hand. Three are occupied with the cardinal virtues, Faith, Hope, and Charity. The cross, the anchor, and the heart are each surmounted by the celestial crown, the latter and former enlivened with bays and amaranth. Education is condensed into one small panel by a trophy of the open scroll books and writing materials. Four of the panels with gothic arched backgrounds in reference to the mediæval city. The leading symbols are facsimiles in *repoussé*, of the leading examples of the city regalia, executed with as much detail as the small space at disposal will permit. One bears the large mace, another the two smaller ancient maces, emblems of authority and defence in troublous times. A third has the sword of state, and the fourth a representation of the city keys. These various framed panels in silver have been placed near the views to which they relate, and the object has been to give in artistic subordination a series of references which will be agreeable to the recipient and which will express the satisfaction of the citizens of Coventry with the good work in so many directions done by Mr. Gulson in their midst.

The casket has been designed and executed in the best style by Messrs. T. and J. Bragg, of Birmingham.

The Market Value of Rubies.

THAT great expectations have no marketable value is a fact which, the *Standard* says, the shareholders of the ruby mines of Burmah will be wise to remember. The first year's experience has not fulfilled the hopes which were justifiably entertained of those mysterious depths from which for ages past the Lord of Many Elephants had filled his treasure jars with precious stones; but, on the other hand, it appears from Sir Lepel Griffin's statement to the shareholders that among those brought to earth is perhaps the largest ruby which has ever been mined This gem, it appears, weighed 300 carats. There may be larger ones in some private collections not open to the mineralogist, but this stone may provisionally claim to be the greatest at present out of the earth.

Unfortunately a ruby requires merits besides weight, and the latest Burmah find is admitted by its best friend not to possess a value which can be assessed in current coin of the realm. However, it is the embodiment of hope, and as gem hunting is even more of a fight with fortune than gold mining there is no reason for doubting that at any moment the waiting men, to whom all things are said to come, like Marlowe's Moor, will pick out of "the Eastern rocks" precious gems as thick as "pebble stones."

It is impossible to say what Burmah has in store. King Theebaw, when sober, used to treat favourite visitors with the sight of his great rubies. He permitted them to dip their arms into the vessels, but his thrifty Majesty took uncommonly good care that nothing stuck to their palms. Most of these treasures were either taken away by the king or stolen in the confusion attending his dethronement, and as they have still to be disposed of the dealers are making their calculations accordingly.

Nothing in the world is so indestructible as a precious stone. Time scarcely affects its surface, and its size is so insignificant that without trouble it may be concealed and carried about, and even swallowed in an emergency. Unlike gold and silver, it is never worn away, or converted into currency, or beaten into the semblance of things in heaven or upon earth. A ruby or diamond represents almost unchangeable value.

Japanese Mirrors.

AN interesting lecture on these peculiar mirrors was delivered recently in Brooklyn by Professor T. C. Mendenhall, president of the American Association for the Advancement of Science, and superintendent of the United States Coast and Geodetic Survey. Professor Mendenhall began his lecture by giving the history of mirrors, especially those of Japanese manufacture. He related in brief the myth in which the origin of the Japanese mirror was described, and which also explained how the mirror became an object of worship in Japan. The sun goddess, who in ancient times lived in Japan, had control of various matters; among others that of sunlight. This goddess had frequent difficulties with her brother, and on one occasion became so enraged that she retired into a cave, and closed the mouth of the cave with a stone; in consequence of this, darkness reigned in Japan. The citizens of the country made every effort to induce the goddess to withdraw from her hiding place, but to no effect, until a genius of that country conceived the idea of making a mirror. He at once attempted the task, and in a short time produced a bronze mirror with a highly polished surface. Thereupon the citizens formed a plan for inducing the fair goddess to leave her place of seclusion. They proceeded to the mouth of the cave, and with music and dancing gave audible evidence of having a very enjoyable time. The goddess, with true feminine curiosity, moved the stone slightly from the mouth of the cave, so as to enable her to peer out and see what was going on. On inquiry she ascertained that the people had found a goddess more beautiful than herself. Her jealousy being excited, she moved the stone still further, to enable her, if possible, to see the new object of admiration, when the people held the mirror before her face, and she beheld the reflection of her own countenance. Appreciating the great compliment, she withdrew herself from the cave, and Japan was once again favoured with sunlight.

In the course of time the sun goddess departed from the country, after having instructed the people to worship in her stead the mirror which she would leave behind her. It is said that the identical mirror in which this goddess beheld her own countenance is still in existence in one of the temples of the country.

Professor Mendenhall said this was the explanation of the existence of the mirror and its use as an object of worship, but he would not venture to explain the incongruities of the story. He said the mirrors were made of a bronze formed of copper and tin, in the proportions of about seventy-five parts of copper to twenty-five of tin. The metal was cast in a mould and the mirror was prepared for use by first scraping it roughly with a tool, then dressing it with a tool which acted partly as a scraper and partly as a burnisher. By this means the surface of the mirror was gradually reduced to a smooth and nearly plane surface. The next operation was that of polishing, which was accomplished by means of certain polishing powders. The final finish was given to the mirror by applying to it a very slight coating of mercury by means of a piece of charcoal and a vegetable acid. The fruit acid was prepared from the juice of a plum. It insured a perfect union of the mercury with the surface of the bronze.

It was discovered many years ago that some of these mirrors would reflect from their polished surface an image corresponding to the ornamentation on the back of the mirror, while this image could not be discerned upon the reflecting face of the mirror. These mirrors were known as "magic mirrors." Professor Mendenhall said that in selecting a magic mirror, it was necessary to reflect the sunlight upon a surface from the mirror, and he early discovered that it made a remarkable difference in the price of a mirror if it was capable of producing an image upon a wall. He therefore conceived of another plan of selecting magic mirrors, which consisted in viewing the reflection of a pair of parallel lines, such as two edges of a moulding. If these lines remained parallel when reflected from every portion of the mirror, it had no magic properties; but if, on the other hand, the lines were seen to diverge in different places with the mirror in certain positions, it was laid aside for further examination, and it was generally found to be a true magic mirror.

The explanation of this curious effect has been attempted by many physicists, some of whom thought the effect was due to the difference in density of the bronze, but a French physicist and our own professor, A. Young, the well-known astronomer, discovered simultaneously the true cause of the magic effects. It was found to be due to inequalities in the surface of the mirror, and discoverable by direct inspection. In the manufacture of the mirror, the scraper and burnisher produced the effect of stretching the surface of the thinner portions of the metal, so as to render them very slightly convex, while the thicker portions retained their plane surface; the convex portions of the mirror dispersed the light, while the plane surfaces reflected the light in parallel beams. The Japanese mirrors having magical qualities are always found to be thin.

Professor Mendenhall projected by the aid of an electric light a number of reflections of mirrors having different figures upon their back surfaces. In many of the images on the screen figures like those on the back of the mirrors appeared sharp and clear.

While professor of physics in the Imperial University of Japan, at Tokio, Professor Mendenhall had every opportunity for studying the manufacture of these curious objects. He succeeded in having a magic mirror made to order, notwithstanding the assurances of the manufacturer that it was impossible. This mirror was projected on the screen. The figure consisted of a series of checks. To show how a slight distortion on the surface produced a material change in the form of the figure on the screen, Professor Mendenhall heated the centre of this mirror by means of a flame. The distortion of the lines and the enlargement of the central squares of the figure upon the screen showed clearly what had taken place in the mirror. Its central portion had been expanded while bound by its cooler periphery, this causing the central portion to bulge out and produce the effect described. He produced similar effects by merely touching the back of the mirror with a pencil. To more clearly illustrate the effects of bulging in the centre of the mirror, a piece of plane glass mirror, having upon its surface two black parallel lines, was placed in the beam of the electric light. The bending of the mirror so as to render it very slightly convex caused the lines to separate upon the screen and the light to be perceptibly lessened, while the bending of the mirror in the opposite direction exhibited a concentration of the light and the approach of the black lines toward each other.

Professor Mendenhall said that the manufacture of bronze mirrors was retained in the families of the mirror makers for generations. The magic mirror having the checks was made to order by a member of the seventh generation of mirror makers.

Although glass mirrors are being largely introduced into Japan, they have not displaced the bronze mirrors, nor can they do so, so long as the beliefs and practices of the Japanese remain unchanged.

At the close of his lecture, Professor Mendenhall mentioned the fact that the magic mirror involved the principle which is now being applied in the invention popularly known as "seeing by electricity." At one end of the line is placed a mirror made up of a series of minute strips of steel behind which is arranged a corresponding series of small electro-magnets. At a distant station the line was connected with an instrument formed of a multitude of selenium cells connected electrically with the magnets behind the steel mirrors. Selenium has the property of having its residence changed by the action of light. A strongly illuminated object placed in front of the selenium receiver changes the resistance of the instrument at the points of illumination, so that currents of different strength are transmitted to the magnets of the receiving instrument. These magnets bend the steel mirror so as to produce temporary effects the same as those produced permanently in the magic mirrors. A light reflected from the steel mirror shows an image representing with more or less accuracy the object in front of the selenium transmitter.

The New American Silver Bill.

THE Director of the Mint, according to the *Keystone*, said recently that there appears to be a general misapprehension as to the operations of the new silver law in case the price of silver should advance to parity. "Some of the papers state that in such cases the Government will cease buying, while others hold that we shall then have free coinage." He explained that "if silver should reach its old parity the Government would continue to buy 4,500,000 ounces a month—or so much thereof as might be offered—under the provisions of the present law. The new law does not provide that purchases shall cease when silver reaches parity, but that the Government shall not pay in excess of \$1 for 371¼ grains of pure silver, or, what is the same thing, shall not pay in excess of \$1·2929 per fine ounce. The amount of pure silver in the silver dollar being 371¼ grains, if the Government paid \$1·2929 per fine ounce (480 grains) it would be paying exactly \$1 for 371¼ grains; that is to say, the market value of the pure silver in the silver dollar would be exactly equal to the face value of the coin, so that the Government could lose nothing by continuing to buy at that rate, which the law contemplates. While this would not be free coinage, and in the absence of further legislation there is no provision for free coinage, it would be practically free coinage for 4,500,000 ounces of silver a month; that is, we would receive from depositors 4,500,000 ounces of silver, and give them for it the exact amount of money which 4,500,000 ounces would make in coin. Of course the Government could not pay in excess of that rate, because if it did the value of the silver in the silver dollar would be greater than its value as a coin, which would be a losing operation."

The Electrolytic Method as applied to Palladium.

OUR knowledge bearing upon the behaviour of this metal towards the current is limited and rather indefinite. In 1868, Wöhler published in the *Annalen*, **143**, 375, an article entitled, "Ueber das Verhalten einiger Metalle im elektrischen Strom," from which the following facts are taken: Palladium, as the positive pole of a battery, consisting of two Bunsen cells, was immersed in water acidulated with sulphuric acid, when the metal immediately became coated with a deposit having a bright steel-like colour. This deposit is doubtless palladium dioxide, as it liberates chlorine when treated with hydrochloric acid, and carbon dioxide when warmed with oxalic acid. At the same time, black, amorphous metal separated upon the negative pole. Its quantity was slight. In the second edition of *Classen's Quantitative Electrolysis*, p. 72 (American edition), it is stated that a feeble current will deposit palladium in a beautiful metallic state from an acid solution. One Bunsen cell is given as sufficient for this purpose. A more energetic current produces a spongy deposit. Ludwig Schucht has communicated* that from an aqueous solution of palladious nitrate, acidulated with a few drops of nitric acid, the current precipitated upon the negative pole a bronze coloured deposit, which, as it grew more dense, became darker, and finally black in colour. At the positive pole there was a simultaneous deposition of oxide, showing a reddish colour. In alkaline palladic solutions the precipitation of metal was much retarded; the deposition of oxide was also observed.

Our first experience in the electrolysis of palladium salts was acquired from the double cyanide in an excess of potassium cyanide. In such solution a current generating one cc. oxyhydrogen gas per minute, failed to cause metallic deposition until after the expiration of thirty-six hours; in other words, not until the excess of potassium cyanide had been completely converted into alkaline carbonates. Then the deposit was black in colour, but the precipitation was not at all complete. No deposition of oxide was noticed upon the positive pole. The conduct of the metal in cyanide solution led to the trial of certain separations, the results of which will be given in a later communication. The action of the current (feeble) was also tried upon a solution of palladious chloride, in the presence of a large excess of potassium sulphocyanide. In this case the deposition of metal was exceedingly rapid. Spongy spots were noticeable. The deposit was black in colour. The experiment was made with this solution in the hope that possibly a separation of copper from palladium might be found; but, as these metals separate with equal rapidity from their sulphocyanides, the results are valueless for this purpose.

The next attempt was made with palladammonium chloride, $Pd(NH_3)_2Cl_2$, in just sufficient ammonium hydroxide to retain it in solution. The total dilution of the solution was 125 cc.; the acting current gave 0·9 cc. OH gas per minute. The poles were distant from each other about two inches. Just as soon as the circuit was completed, a yellowish-brown coating appeared upon the spiral of the positive pole; while upon the dish in connection with the negative pole, a deposit of metal closely resembling the platinum itself in colour made its appearance. After acting through the night the current was interrupted, the metal deposit carefully dried and weighed. The precipitation was incomplete. It was, however, discovered that the deposition at the positive pole, which gradually increased in mass and assumed a black colour, had entirely disappeared. In all instances where the ammonium hydroxide was in decided excess, the precipitation of oxide on the positive pole was not observed. This behaviour is similar to that of nickel when its ammoniacal solutions are electrolysed. In subsequent experiments the course was somewhat modified. From solutions such as just described, the palladium thrown out upon the platinum dish was extremely slow in dissolving, even in fuming nitric acid, so that it was deemed expedient to first coat the platinum dishes employed in the electrolysis with a layer of silver, varying in weight from 0·1 to 0·3 gram. This was done in the experiments recorded below, and was found to be decidedly advantageous. The layer of silver seemed to hasten the deposition of the palladium.

EXPERIMENT I.

A quantity of palladammonium chloride (=0·2228 gram Pd) was dissolved in ammonium hydroxide; to this solution were added 20 to 30 cc. of the same reagent (sp. gr. 0·935) and 75 cc. water. The current allowed to act upon this ammoniacal liquid gave 0·9 cc. oxyhydrogen gas per minute. The decomposition continued through the night. At no time was there any oxide deposition upon the anode. The palladium gradually assumed a bright metallic appearance. After drying, the deposit showed about the same appearance as is ordinarily observed with this metal in sheet form. The washing was limited to hot water, and when the deposit was perfectly dry, the dish containing it was covered with a watch glass and exposed to a temperature ranging from 110° to 115° C. This was done to expel any hydrogen that might possibly have been retained by the palladium.

Weight of silvered dish + Pd = 61·9575 grams.
" " " —Pd = 61·7350
0·2225 Pd.

EXPERIMENT II.

In every respect similar to Experiment 1, gave

Weight of silvered dish + Pd = 71·9540 grams.
" " " —Pd = 71·7315
0·2225 Pd.

The filtrates from these deposits were warmed for eight hours with ammonium sulphide without showing any formation whatever of palladium sulphide.

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* Berg- und Hüttenmännische Zeitung **38**, 121; also, Zeit. für anal Chem., **22**, 240.

In several experiments, with conditions unlike those just described, and where consequently an incomplete precipitation of metal occurred, the digestion with ammonium sulphide produced in every instance, in a very short time, a reddish-brown flocculent sulphide, carrying with it quite a considerable quantity of free sulphur.

In a second series of two experiments, in each of which there was the same amount of palladium as in the previous trials, the quantity of ammonium hydroxide in excess was made 30 cc., while the current (giving 0·8 cc. oxyhydrogen gas per minute) was allowed to act for sixteen hours. The results were quite concordant :

Experiment III.

Weight of silvered dish + Pd = 72·1055
„ „ „ —Pd = 71·8825

Weight Pd = 0·2230 gram.

Experiment IV.

Weight of silvered dish + Pd = 62·0512
„ „ „ —Pd = 61·8280

Weight Pd = 0·2232

It may be remarked that in filling the silvered platinum dishes a rather large surface of silver was allowed to remain above the electrolysed liquid, so that by merely adding water it was possible to ascertain when the palladium was fully precipitated. When the deposition was not finished the new silver surface soon showed streaks of metal.

A third series of two experiments, in which the added amount of palladium was double that recorded in the preceding examples, the same conditions were observed as before, with the exception that as the current was only giving 0·70 cc. oxyhydrogen gas per minute, the time of precipitation was extended to eighteen hours. The results were as follows :

Experiment V.

Weight of silvered dish + Pd = 72·3555
„ „ „ —Pd = 71·9100

Weight Pd = 0·4455

Experiment VI.

Weight of silvered dish + Pd = 62·2600
„ „ „ —Pd = 61·8138

Weight Pd = 0·4462

Curiously enough, upon warming the liquid poured off from the palladium in Experiment V., with ammonium sulphide there appeared a very slight sulphide precipitate after some hours. The liquid from Experiment VI. showed no trace of unprecipitated metal.

The deposits in the experiments just recorded were bright, metallic, and very dense. In none was there the slightest tendency to sponginess. To show the accuracy of the method, the results may be tabulated as follows :

Experiment.	*Found Pd.*	*Calculated Pd.*
I.	0·2225	0·2228
II.	0·2225	0·2228
III.	0·2230	0·2228
IV.	0·2232	0·2228
V.	0·4455	0·4456
VI.	0·4462	0·4456

If the percentage differences be calculated, it will be found that they are quite within the limit of error occurring in almost any ordinary gravimetric determination.

The behaviour of ammoniacal palladium solutions, when exposed to the action of the electric current, will be further studied as time permits, and, if possible, the attempt will be made to re-determine the atomic weight of the metal by this method in a somewhat modified form.

Edgar F. Smith and Harry F. Keller in *The Journal of the Franklin Institute.*

Precious Stones.*

WHAT is a precious stone? The answer to this question is not easy; for the value of a particular kind of stone is often due in great measure to the caprice of fashion or to some adventitious circumstance of time or place; and some stones that are to-day of small value have, during certain periods in the past, almost displaced the diamond or the ruby in public estimation. Beauty of colour, hardness and rarity are the essential qualities which entitle a mineral to be called precious. Strictly speaking, the only precious stones are the diamond, ruby, sapphire, and emerald, though the term is often extended to the opal, notwithstanding its lack of hardness, and to the pearl, which is not a mineral, but strictly an animal product.

Popularly, a gem is a precious or semi-precious stone, when cut or polished for ornamental purposes. Mineralogically, the term designates a class or family of minerals hard enough to scratch quartz, without metallic lustre, but generally brilliant and beautiful, and includes the semi-precious or fancy stones (called pierres de fantasie by the French), such as the chrysoberyl, alexandrite, tourmaline, spinel, topaz, garnet, and amethyst. Archæologically, the term is restricted to engraved stones, such as intaglios and cameos. The term jewel is applied to a gem only after it has been mounted.

The epithet phenomenal is used in regard to stones which exhibit an unusual or singular play of colour, such as opal, moonstone, sunstone, and Labrador spar; or which change their colour by artificial light, like alexandrite; or show a line or band or bands of light, as the line in the cat's-eye and the star in the sapphire and ruby asteria.

Before mineralogy became the exact science that it is to-day, and even at the present time, precious stones were determined only by the eye; hence, in ancient times, they were confused with one another, as unfortunately they are sometimes in the present age; so that the ruby, spinel, garnet, and rubellite were all probably known as carbuncle, and the yellow sapphire, yellow topaz, yellow quartz, yellow zircon, and yellow tourmaline were all known as topaz.

At present, however, the eye, which is not always accurate, is not alone depended on. Specific gravity and certain other methods are now employed in the exact determinations of precious stones. First, by specific gravity, occasionally by means of solutions (such as Sonstadt's or Thoulet's solution, the double iodide of potassium and mercury), which can be made to vary from over three times the weight of water to the specific gravity of the gem lowest in the scale; again, by the aid of the scale of hardness, the diamond being ten, sapphire nine, topaz eight, quartz seven, feldspar six, apatite five, fluorite four, and calcite three. Among optical means, we find the dichroscope of great assistance, as many gems possess dichroitic properties, showing two images of each object viewed, and these differ in colour in the various gems; by the use of the spectroscope we find that the ruby gives a bright red band, the garnet a large series of absorption bands, etc. By means of the polariscope, the crystalline system to which the precious stone belongs can be readily determined. By passing a cut stone of yellow or white quartz through the fingers and a yellow topaz of the identical shade of the quartz, we find that the topaz is slippery, while the quartz offers considerable resistance. Certain gems are electrical, notably so, amber, tourmaline, and topaz, the latter retaining this property for some time after heating.

The diamond crystallizes in the isometric system, and is usually found as an octahedron or as some modification of that form. It is ten in the scale of hardness, and is the hardest of all known substances. Its composition is pure carbon. It has a greater refractive and dispersive power on light than any other gem, and is the only one that is combustible. Its specific gravity is about 3·525. In colour, its range is extensive, it having been found in almost every colour of the spectrum, though more commonly white, yellow, brown; rarely rose-red, red, blue, and green.

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*A Lecture by George F. Kunz, delivered before the Franklin Institute.

An impression seems to prevail that a diamond will not break if struck with a hammer on an anvil, and more than one fine stone has been shattered in attempted tests, thus proving the fallacy of the assertion. While the diamond is very hard, it is also very brittle, and can be easily broken; and although every substance, from the hardness of feldspar up, including a cleavage or cut diamond, will scratch glass, nothing but the natural edge of a diamond crystal will cut it. If a stone will scratch corundum, and is not scratched by a diamond, it is safe to assume that it is a diamond. It is well to make the trial on a smooth or polished surface, otherwise the scratch will not be perceptible.

The author of the *Arabian Nights* undoubtedly thought he was imagining the wildest and most improbable things when he wrote of Sinbad the Sailor's obtaining his treasures in the Valley of Diamonds; yet the African mines have paled this profusion of wealth into utter insignificance. A glimpse of these new Valleys of Diamonds may prove interesting. Before the opening of the South African mines, the primitive method of washing diamonds was carried on by thousands of slaves, who, like those who built the pyramids under the lash of the Pharaohs, simply obeyed a master who mercilessly goaded them on, whip in hand. This method is, to-day, replaced by the most ingenious and powerful machinery, which, eyeless though it be, allows fewer diamonds to escape than would the keenest and most disciplined army of washers.

At the Kimberley Diamond Mines, in South Africa, wonderful progress has been made in the last decade. About 1877, the work of consolidation of the different companies began. Originally, the mines were worked as 3,238 separate claims, each thirty-one feet square, separated by a seven-and-a-half-foot roadway.

A mine in the early days was a bewildering sight. Miles of wire cables were stretched across it in all directions, and to these were attached the buckets for carrying the earth, reef, or wall-rock of the mines, or, at times, water, and all running from individual claims. Some of these latter were almost level with the surface, while others next to them might be cut down 200 feet, and others only 100 feet, yet all were worked independently. At the sides were endless belts, with pockets for carrying the earth. The result of this independent system of working was that rock was dropped so recklessly that, it is said, the vicinity of the claims was as dangerous as a battle-field. The loss of life was great, not from this source only, but also from the falling of immense masses of reef, loosened by the blasting, which several times buried a score of men at once. But improved methods were gradually introduced. Steam railroads were run down into the mine, and parts of it were levelled. Millions of tons of reef required moving, and millions of gallons of water required to be pumped to the surface; the only way to do it was to assess every company in the mine proportionally. Many mistakes were made at first, if mistakes they can be called, when the problems offered for solution were entirely new and untried. The yellow or surface soil which overlaid the blue stuff pulverized so readily that it could be taken to the washing machine directly, but as the claims were sunk down in the blue earth, the rock grew harder, and dynamite became necessary. Immense quantities of it are now used for blasting. On January 10, 1884, through carelessness, thirty tons of dynamite and ten tons of blasting-powder and gelatine, in all worth $80,000, exploded with terrific effect; the smoke column was 1,000 feet high, and visible at the River Diggings, thirty-five miles distant.

After the earth "blue," as the diamond rock is called, is raised, it is put on the sorting ground, where it is partly disintegrated by water and the action of the atmosphere. It is then broken by hand and taken to the "compound" or diamond sorting machine, a large machine into which the rock is thrown from the sorting and breaking floors. It is here broken into still smaller fragments, and then passed down into large vats, containing immense centrifugal wheels, on which, as they rapidly revolve, the rock is finely divided. The lighter materials, such as altered olivine, quartz, mica, and mud are then floated out, while the diamonds, garnets (some of which are exceedingly rich in colour and of large size, are sold under the name of Cape rubies), and other heavy minerals are concentrated together in the lowest part of the "compound." So carefully is the rock and earth washed that all the diamonds down to the size of a pinhead are saved.

Since great depths have been reached, and even before, the recent consolidation became an absolute necessity to work the mines.

A prize of £5,000, offered for the best tunnel or shaft system for use at the Kimberley Mines, was awarded to the Jones' system, which is sunk on the coffer-dam principle. At present there are many shafts and inclined planes in the Kimberley Mine alone, all sunk at some point in the reef outside of the mine. From 11,000,000 to 13,000,000 gallons of water were annually hoisted from the Kimberley Mines at a cost of sixpence per load of 100 gallons.

Five years ago, in addition to many miles of aërial tramways, there were over 170 miles of tramway around the four Kimberley Mines: while 2,500 horses, mules, and oxen, and 350 steam engines, shafts, etc., representing 4,000 horse-power, were employed in the work. One million pounds sterling were annually expended for labour, and over £1,000,000 for fuel and other supplies. The gross capital of the companies was then nearly £10,000,000. Over 10,000 natives, each receiving £1 a week, and 1,200 European overseers. at an average wage of £5, were employed.

The supposition so long talked of, that a unification would ultimately be accomplished, and the diamond mines consolidated into one gigantic trust for the regulation of prices and production has been realized, the DeBeer's Mine Company having absorbed so many companies during 1888 and the early part of 1889, that they control the output of mines which yield twenty-nine-thirtieths of all the diamonds in the world. As a result, they have limited the production. The cost of mining having become necessarily higher, as it was carried to greater depths, and larger dividends were required to pay the interest on the stock of the DeBeer's Mining Company, which now amounted to between £18,000,000 and £20,000,000; cut diamonds have therefore advanced twenty-five per cent. in value during the last nine months of 1889, and the price is not likely to recede. The advance of twenty-five per cent. on the cut stones is equal to nearly seventy-five per cent. on the rough material. One effect of the increased price of rough stones and the limitation of the output, has been that some thousands of diamond cutters have been thrown out of employment at Antwerp and Amsterdam.

On the other hand, one benefit of the consolidation has been the introduction of what is known as the compound system, by which the "boys," as the miners are called, are housed and fed under contract for a certain term, provided with amusements and liquor, and thus kept apart from the influences of the vicious whites, who instigate them to crime in their "canteens," as the groggeries are called, which are maintained by the I.D.B.'s. It became a question at one time whether the mines could be profitably worked, when from one-fifth to one-quarter of all the yield, it was estimated, never reached the proper owners, as the native diggers swallowed and concealed the diamonds in every possible way. It became necessary for the companies, in self-defence, to take extraordinary precautions against this great loss. Overseers or special searchers were appointed, who made the most thorough examination of all who left the mines. The natives use most ingenious methods for the concealment of the gems. On one occasion some officers, suspecting that a Kaffir had stolen diamonds, gave chase, and caught up with him just after he had shot one of his oxen. No diamonds were found upon the Kaffir, it is needless to say, for he had charged his gun with them, and after the disappearance of the officers, he dug them out of his dead ox. Diamonds have been fed to chickens; and a post-mortem examination a few years ago, held over the body of a Kaffir, revealed the fact that death had been caused by a sixty-carat diamond which he had swallowed. Early in the history of the mines a detective force, consisting of men, women, and children, was formed, and the severest punishment is still inflicted on transgressors of the Diamond Act.

None but those authorised by the law, termed patented agents, less than fifty in number, are allowed to purchase or even to possess rough diamonds at Kimberley. The loss would not have been so great but for the irregular diamond I.D.B.'s, as the "fences" are called, who lowered the price of stones by underselling the companies in the London market.

More diamonds weighing over seventy-five carats each after cutting have been found since the African Mines were opened than were known before. The most important one found in South Africa is the Victoria diamond, or Imperial diamond, as it is called. The original crystal weighed $457\frac{1}{2}$ carats, or over three ounces Troy. Strange to say, although this is the largest diamond of modern times, its early history is very obscure. It is reported that the stone was found in the Kimberley Mines in the month of July, 1884, by a surveillance officer, and by him sold to some illicit diamond buyers, and afterwards to a syndicate of European dealers. The stone has been cut, and in its finished condition weighs 180 carats. It is a beautiful, perfect, "steel-blue" diamond, and the largest white brilliant known, and is valued at $200,000. Amongst some other large diamonds may be mentioned the Du Toit, which weighed 244 carats when found; the Jägersfontain, $209\frac{1}{4}$ carats; the Stewart diamond weighs 260 carats; the Tiffany yellow, weighing $125\frac{5}{8}$ carats after cutting; the great Orange, 110 carats; the Porter Rhodes, weighing 68 carats after cutting; the Dudley, $46\frac{1}{2}$ carats, and a number of others.

Thirty-eight million carats of diamonds, weighing over nine tons, have been found here. In the rough, their aggregate value was $250,000,000, and after cutting nearly $600,000,000, which is more than the world's yield during the preceding two centuries. Of the whole production, not more than eight per cent. can be said to be of the first water, twelve per cent. of the second water, and twenty-five per cent. of the third, while the remaining forty-five per cent. is called bort, a substance which, when crushed to a powder, is of use in the arts for cutting hard substances and for engraving. This must not be confounded with the bort carbon (carbonado) found in Brazil, an uncrystalline form of the diamond, which from its amorphous structure is adapted for use in drills, for boring and tunnelling rocks, etc., and has never yet been found in South Africa. It is worth from six to ten times as much as bort.

An English company has recently been formed, under the name of the Hyderabad Mining Company, to work the mines in India, where it is thought that the famous Koh-i-noor diamond was found.

India and Borneo are now yielding very few diamonds, less than one per cent. in all of the entire product. These two countries, together with Brazil, yield probably less than five per cent. of the total output.

Diamonds have been found in the tertiary gravels and recent drifts near Bingera in Inverell, Australia; also along the Cudgegon river, 160 miles north-west of Sydney, and in other districts in Australia. The colours are white, straw, yellow, light brown, pale green, and black. The largest stones yet found were cut into gems weighing three and one-half and three carats respectively. A trial made by the Australian Diamond Mining Company produced 190 diamonds, weighing $197\frac{3}{4}$ carats, from the washing of 279 loads of earth. These Australian fields can scarcely be called productive as yet, nor from present appearances do they seem likely to become formidable competitors of the South African fields.

About twelve years ago, it was suggested by Messrs. Dunn, Cohen, Huddleston, and Prof. Rupert Jones and others, that the South African diamonds were formed in a sort of volcanic mud. Mr. Huddleston thought that the action was hydrothermal rather than igneous, the diamonds being the result of the contact of steam and magnesian mud under pressure upon the carbonaceous shales; he compared the rock to a boiled plum-pudding.

At a meeting of the Manchester Literary and Philosophic Society, held October 21, 1884, Prof. H. E. Roscoe presented a paper on the diamond-bearing rocks of South Africa, in which he said that he had noticed a peculiar odour, somewhat like that of camphor, evolved on treating the soft "blue" diamond earth with hot water. A quantity of this earth he powdered and digested with ether, and on filtering and allowing the ether to evaporate, he obtained a small quantity of a strongly aromatic body, crystalline, volatile, burning easily with a smoky flame, and melting at about 50° C. Unfortunately, the quantity obtained was too small to admit of a full investigation of its composition and properties. He suggested that perhaps the diamond was formed from a hydrocarbon simultaneously with the aromatic body.

The late Prof. H. Carvill Lewis, at the British Association meeting, September, 1886, read a paper on the genesis of the diamond, in which he stated that from the DeBeer's mine, at a depth of 600 feet, he had obtained specimens of rock which were unaltered, and proved to be a peridotite containing carbonaceous shale. He added that from information he had received from New South Wales, Borneo, and Brazil, he then believed that all diamonds were the result of the intrusion of a peridotite through carbonaceous rocks and coal seams.

The similarity of the South African peridotite to a peridotite described by Mr. J. S. Diller, in Elliott County, Ky., led Prof. Lewis to suggest interesting possibilities there, and through the invitation of Prof. Proctor, of Kentucky, Major Powell sent Mr. J. S. Diller and myself to examine this Kentucky peridotite. Although the associated minerals were identical with those accompanying the diamonds, *i*, *e*., of South Africa—pyrope garnet, ilmenite, biotite, pyroxene among others being present—yet by analysis of the enclosed carbonaceous shales, from which it was believed that the diamond is formed, it was found that the Kentucky shale contained only ·681 of carbon, while the South African contained thirty-five per cent., and could be readily ignited with a match. Hence, unless the peridotite has penetrated the older and richer Devonian shales, the probability of finding diamonds there has been considerably weakened by the investigation.

The occurrence of diamonds in the United States is chiefly confined to two regions, geographically very remote and geologically quite dissimilar. The first is a belt of country lying along the eastern base of the Southern Alleghanies, from Virginia to Georgia, while the other extends along the western base of the Sierra Nevada and Cascade ranges in Northern California and Southern Oregon. In both cases, the mode of occurrence has several marked resemblances. The diamonds are found in loose material, among deposits of gravel and earth, and are associated with garnets, zircons, iron sands, monazite, anatase, and particularly with gold, in the search for which they have usually been discovered. This resemblance is due altogether to the fact that these loose deposits, in both regions, are merely the débris of the crystalline rocks of the adjacent mountains and therefore present a general similarity, while the ages of the rocks themselves are widely different.

The finding of a twin crystal of diamond, weighing four and one-third carats, at Dysortville, N. C., of a three-carat stone near Atlanta, Ga., and of a three-eighths-carat stone at Montpelier, Adair County, Ky., are worthy of mention in connection with the finding of diamonds in the Southern States.

Ten years ago, $100,000 was an unusual amount for even the wealthiest to have invested in diamonds; whereas, to-day there are a number of families each owning diamonds to the value of $500,000. Earrings worth from $5,000 to $8,000 a pair excite no wonder to-day; formerly, they were seldom seen. Of the French crown-jewels sold in Paris, May, 1886, more than one-third, aggregating over $500,000 in value, came to the United States.

Imports of Diamonds into the United States.

From the Customs import lists, after deducting the approximate value of cut stones other than the diamond, we find that import duty was paid on about $120,000,000 worth of cut diamonds in the last twenty-four years, of which $90,000,000 worth were imported during the last twelve years. In 1868, $1,000,000 worth were imported, and about $1,200,000 worth in 1867, but about $11,000,000 in 1888, and the same amount in 1889, or ten times as many in the latter year as twenty years previous, showing the increase of wealth and the great popularity of the diamond among Americans, the previous figures representing the import prices, exclusive of mounting or dealers' profits. A single firm at present sells yearly more than the annual import of 1867.

The expression "first water," when applied to a diamond, denotes that it is free from all traces of colour, blemish, flaw or other imperfection, and that its brilliancy is perfect. It is, however, frequently applied to stones not quite perfect, but the best that the dealer has, and they may be of only second quality. It is almost impossible to value a diamond by its weight only. Colour, brilliancy, cutting and the general perfection of the stone have all to be taken into account. Of two stones, both flawless and of the same weight, one may be worth $600, and the other $12,000. Exceptional stones often bring unusual prices, while off-coloured stones sell for $60 to $100 a carat, regardless of size. The poor qualities have depreciated so much in value that some are worth only from one-tenth to one-fourth what they were worth twenty years ago. This is specially true of large stones of the second or third quality.

The names ruby, sapphire, Oriental amethyst, Oriental emerald and Oriental topaz are given to the transparent red, blue, purple, green and yellow varieties, respectively, of the mineral corundum. These colours are supposed to be due to the presence of minute quantities of metallic oxides. The specific gravity of corundum varies from 3·98 to 4·05; its hardness is nine. The finest pigeon-blood-coloured rubies are found at Mandalay, in Burmah, and when fine command from five to ten times the value of diamonds of equal weight. Fine rubies, generally small, sometimes of a pink colour, and often with a currant-wine or purplish tint, are found at Ratnapoora, Ceylon; likewise in Siam, where, however, the colour is commonly a dark red, almost that of a garnet, and, like it, with a tinge of brown. The finest sapphires are found in Burmah and Ceylon; in the latter, some of the finest corn-flower blue varieties occur. Many of the rich velvety blue, as well as the lighter-coloured stones are from the Simla Pass in the Himalayas. Fine sapphires have recently been found in Siam; and in Australia they occur of an opaque, milky-blue colour.

Dr. William Crookes, after an elaborate series of experiments with all colours of corundum in sealed tubes, believes that the various colours are only modifications or allotropic forms of the same substance; and that since all the colours of corundum phosphoresce with the same range of colours in the phosphorescope, he suggests that there is no colouring matter.

The acquisition of the Burmese Ruby Mines cost the British Government a vast sum of money. On the wars of 1826 and 1852 England expended $75,000,000 and $15,000,000 respectively; and after all this sacrifice of treasure the Burmah and Bombay Trading Company claimed, four years ago, that King Theebaw, of Burmah, had arbitrarily cancelled the leases by which the company controlled the output of the ruby mines near Mandalay.

The war of 1886, which followed, involved the raising of an army of 30,000 men and an outlay of $5,000,000, but the British Government gained control of the long-coveted ruby mines.

The question which next presented itself was, how should they be worked? Several firms were desirous of securing the lease, and after the Indian Government had virtually closed a lease to Messrs. Streeter and Co., the London jewellers, at an annual rental of four lakhs of rupees (£40,000) for a term of five-and-a-half years, it was at first revoked, but after a time was given to Messrs. Streeter and Co., who organized the company known as the Burmah Ruby Mines (Limited), and sent a force of engineers and a quantity of machinery to Burmah. This year will determine whether or not the mines are as rich as they were supposed to be, and whether the ruby will still retain its place as the most costly of precious stones.

The ruby mines of Burmah are situated in the valley of Magok, fifty-one miles from the bank of the Irrawaddy River and about seventy-five miles north of Mandalay, at an altitude of 4,200 feet. Concerning these mines very little was known, as they were always the monopoly of the Crown and were jealously guarded. It was said that they paid King Theebaw's Government 100,000 rupees per annum and one year 150,000 rupees. Mining was carried on by forty or fifty wealthy natives, who employed the poorer townspeople at liberal wages; but at present only seventy-eight mines or diggings are in operation. All the gems were sent to Ruby Hall, Mandalay, to be valued.

One thing at least we learned from the British occupation of Burmah, namely, that King Theebaw did not own the dishes of rubies which were said to rival anything known. An examination of the jewels, now deposited at the India Museum at South Kensington, proved that there was only one cabochon ruby of fair, not fine quality, and several polished sections of a large inferior crystal of emeralds of any value in his entire crown jewels.

In 1882, a very remarkable discovery of sapphires was made in the Zenskar range of the North-western Kashmir Himalaya, near the line of perpetual snow. A landslide removed an abundance of sapphires which were first used as gun-flints by the natives. One writer speaks of having seen about a hundredweight of them in the possession of a single native. Traders, however, soon carried them to the distant commercial centres, where their value became known. There was an instant rush of jewellers' agents to the locality of the mine; and the price rose rapidly until about £20 per ounce was paid for the rough sapphires as found. The Maharajah of Cashmere promptly exercised his authority, and sent a regiment of Sepoys to take possession of the mines and harry the natives who were suspected of having stones in their possession or any knowledge of new localities where the gems could be found. Anyone who had money was suspected either of having sold sapphires or of being about to purchase them, and was despoiled or even imprisoned. This naturally enough had the effect of compelling secrecy. Several crystals were found weighing from 100 to 300 carats each. During the first year of the discovery, the Delhi jewellers are said to have bought up sapphires to the value of £20,000.

The effect of this discovery was to lower the prices, for a time only, however.

Public interest in semi-precious stones has increased greatly during the last ten years. Formerly jewellers sold only diamonds, rubies, sapphires, emeralds, pearls, garnets, and agates; but at present it is not unusual to have almost any of the mineralogical gems, such as zircon, asteria or star sapphire or star ruby, tourmaline, spinel or titanite called for, not only by collectors, but by the public, whose taste has advanced in the matter of precious stones, as well as in the fine arts.

This change may be partly attributed to the fact that since the Centennial Exhibition, art has received more attention among us than ever before. The Duke of Connaught's giving his bride a cat's-eye ring as an engagement token was enough to make that stone fashionable, and to increase its value greatly. The demand soon extended to Ceylon, where the true chrysoberyl cat's-eye is found, and stimulated the search for these stones there. In the chrysoberyl cat's-eye the effect is the result of a twinning of the crystal, or a deposit between its crystalline layers of other minerals in microscopic inclusions; so that, if the stone be cut across these layers *en cabochon*, or carbuncle-cut, as it is called, a bright line of light will be condensed on the dome-like top of the stone.

In the search for these chrysoberyl cat's-eyes, there has been found an endless series of chrysoberyls of deep golden, light yellow, yellow-green, sage green, dark green, yellowish brown and other tints. They are superb gems, weighing from one to 100 carats each, and rank next to the sapphire in hardness. It was a great surprise to the gem dealers to find that the darker leaf green or olive green stones possessed the wonderful dichroitic property of changing to columbine red by artificial light, which entirely subdued the green tint, and gave the red predominance. These were in fact alexandrites, stones which had formerly been found only in Siberia, and even there of but poor quality. Though found in large crystals, a perfect gem of even one carat was a great rarity. Here, however, were found fine stones, weighing four carats and upwards, and one exceptionally fine one weighing nearly seventy carats. These can be numbered with the most remarkable gems known. Strange to say, among this variety a few specimens have been found which combine the characteristics of both the cat's-eye and the alexandrite, and are called alexandrite cat's-eyes.

Moonstones, also from this same province of Kandy, Ceylon, were brought to light by this search for cat's-eyes. It would not be an over-estimate to say that 100,000 of these stones have been sold here in the last four years. They vary in size from one-eighth of an inch to nearly two inches in length, and many of them surpass anything hitherto known of their kind in beauty and size. Those that display the chatoyant and the opalescent blue colour are especially beautiful.

The demand for cat's-eyes also brought into request the then rare mineral from the Orange river, South Africa, known as crocidolite, especially that variety that had been altered to a quartz cat's-eye or tiger-eye, as it is called. In this stone an infiltration of silicious water has coated each fibre with quartz or chalcedony, giving it the hardness of seven. This then pleasing stone readily sold for $6 a carat, and at the outset for even more; but owing to the excessive competition of two rival dealers, who sent cargoes of it to the London market, the price fell to $1 or even to twenty-five cents per pound by the quantity. Even table-tops have been made of this material by veneering. Vases, cane-heads, paper-weights, seals, charms, etc., were made of it and sold in large quantities. Burning it produced a bronze-like lustre, and by dissolving out the brown oxide of iron colouring, an almost white substance was obtained, which was dyed by subjecting it to the action of red, green, and brown coloured solutions; these colours, owing to the delicacy of the fibres, were evenly absorbed. A material unknown ten years ago is to-day found at every tourist's stand, whether on the Rigi, on Pike's Peak, in Florida, at Los Angeles, or at Nijni Novgorod, and sold under a variety of names, showing how thoroughly organized is the system of distribution in the gem market. Missionaries have never spread a religious belief as rapidly as traders have disseminated the tiger eye.

Since it has become generally known that Queen Victoria is partial to the opal, the old and stubborn superstition concerning it, which is said to date from Scott's *Anne of Geierstein*, has been slowly yielding, until now the gem has its share of popular favour. During the last two years, ten times as many opals have been imported as were brought here during the preceding decade. Mexican fire opals are much more common, as those tourists know to their sorrow who buy these stones at exorbitant prices in Mexico, hoping thus to pay the expenses of the trip, until they find on reaching New York that they are worth only about one-quarter of what they paid for them. The principal opal mines of Mexico are situated on the Hacienda Esperenza, near Queretera; and it is believed that a demand of 100,000 stones per annum could be supplied without raising the price perceptibly, though in the market of precious stones the demand generally raises the price.

The finest opals are from the mines of Dubreck, Hungary, which, although they have been worked for three centuries, still yield the Government a revenue of $6,000 annually. The output is so carefully regulated that the market is never glutted. In Australia large quantities of opals have been found differing from the Hungarian and yet often quite as beautiful.

About ten years ago a new and very interesting variety of opal was brought from the Baricoo river, Queensland, Australia, where it is found in a highly ferruginous jasper-like matrix, sometimes apparently as a nodule and then again in brilliant coloured patches, or in specks affording a sharp contrast with the reddish-brown matrix, which admits of a high polish and breaks with a conchoidal fracture. Many of these stones are exceedingly brilliant. They are of the variety known as harlequin opals, their colour being somewhat yellow, as compared with the Hungarian stone, although not less brilliant. The rich ultra-marine blue opal is quite peculiar to this locality. A company (capital $200,000) has been formed, and the gems are about to be extensively mined. This stone is especially adapted for curious cameo-like objects, such as faces, dogs' heads, and the like, made by cutting the matrix and the opal together.

In 1877, F. Pisani, of Paris, described a transparent golden yellow spodumene, which has been found in Brazil and was supposed to be chrysoberyl. Strange to say, a little later a yellow green variety associated with emerald tinted beryl crystals, the latter called "green bolts" by the farmers, was obtained by Mr. J. A. D. Stephenson, of Statesville, N. C., who brought it to the attention of the northern mineralogists, Norman Spang, Dr. F. A. Genth, and W. E. Hidden. The latter sent a specimen of this mineral, which he supposed to be diopside, a variety of hornblende, to Dr. J. Lawrence Smith, of Louisville, Ky., who found upon analysis that it was a transparent spodumene instead of diopside, as had been supposed, and named it Hiddenite. This locality has furnished several dozen crystals of the finest emeralds (of little value as gems, however) that have ever been found anywhere. Among them is a crystal eight inches long and another weighing eight and three-quarter ounces, valued at $1,000. Both of these, together with many other fine minerals found here, are in the famous cabinet of Mr. Clarence S. Bement, of Philadelphia, the finest private collection of minerals in the world.

At Stoneham, Me., was found the finest aquamarine on this continent, weighing 125 carats, as well as many other fine stones, weighing in all some hundreds of carats. Some fine transparent yellow beryls were found at Albany, Me.; at the Avondale quarries in Delaware County, Pa., several twenty carats golden-yellow beryls and many smaller ones have also been found; and at a mica mine, near Litchfield, Conn., several thousand dollars' worth of this gem have been obtained. Amelia County, Va., and several localities in North Carolina have also afforded good specimens.

On Mt. Antero, Col., at an altitude of 14,000 feet, nearly on the line of perpetual snow, there have been found (associated with phenacite) some beautiful beryls, clear enough to afford a number of fine gems of good blue and green colour.

In 1882, topaz was first found in Colorado, and since then it has been found in some abundance at Platte Mountain, Cheyenne and at Crystal Peak, near Pike's Peak. Many of the crystals are remarkable for their size, several of them weighing over a pound each. The smaller ones are transparent and range in colour from pellucid white to rich cinnamon-brown. Some few are light blue and light green. The two larger gems weigh 125 and 193 carats respectively, and equalled those from any known locality, but $3,000 would probably be a fair estimate of the value of all that have been found there.

At Stoneham, Me., and at North Chatham, a town adjoining in New Hampshire, topaz, as well as phenacite, was found, the latter transparent enough to cut into gems. A few crystals of topaz, measuring one foot on a face, were also found, and a number of smaller ones, of little value as gems.

The Mount Mica Mining Company, of which Dr. A. C. Hamlin, of Bangor, Me., is the organizer and president, began operations at the famous tourmaline locality, Mount Mica, near Paris, Me., in 1879, and prosecuted the work for three summers. There were found here very beautiful tourmaline crystals, and some of the finest known examples of this gem. A crystal of blue tourmaline, measuring nine inches, and a green tourmaline, ten inches long, were among the most remarkable finds, the proceeds of which altogether have amounted to something over $5,000.

At Auburn, Me., hundreds of crystals of tourmaline have lately been found, some of which have been cut into gems, though they do not approach in perfection those from the more famous Paris locality. In colour, they are generally light green, light blue, and light red.

Five years ago, the existence of rock-crystal of any size was almost unknown in the United States; but about that time, a large, clear mass, weighing some twelve pounds, which had been found in Alaska, was brought to New York City, and made into thin slabs for hand-mirrors. In 1885, a fifty-one-pound fragment, said to have been broken from a crystal which originally weighed 300 pounds, was found in Chestnut Hill Township, Ashe County, N. C. On visiting the locality, I found that most of the crystals there were obtained either by digging where one crystal had been found or by driving a plough until crystals were unearthed. Several dozen crystals in all have been found here, one mass of twenty pounds being almost absolutely pure. Some of the clearer masses have been cut into vinaigrettes, bonbon boxes, clocks and other art objects and exhibited at the Paris Exposition.

Prof. R. B. Riggs, of the laboratory of the United States Geological Survey, recently made over twenty-five analyses of the tourmalines of all colours. He found the question of the colour of the lithia tourmaline a very interesting one. The colour of the iron and magnesian varieties depends on the amount of iron present, ranging from the colourless De Kalb variety through all the shades of brown to the Pierrepont black crystals, while the lithia tourmaline, containing more or less manganese, gives us the red, green and blue, as well as colourless varieties. The shades of colour do not depend on the absolute amount of manganese present, but rather on the ratio existing between that element and the iron. Thus, when the amounts of manganese and of iron are equal, we have the colourless, pink or very pale green tourmaline. An excess of manganese produces the red varieties; and if the iron is in excess, there result the various shades of green and blue.

Turquoise, found in Los Cerrillos, N. M., where it had been worked for years before the arrival of the Spaniards, has recently been identified in Arizona, Colorado and Nevada. Although not of much value as an ornamental stone, it recommends itself for ornamental purposes.

The agatized or jasperized wood of Arizona, the existence of which has been known for thirty years, has only been utilized in the arts during the last four or five years. This material exists in immense quantities, in compact tree sections from one foot to four feet in diameter, and presents the most beautiful shades of yellow, red, brown, white and black, generally mottled, the colours all blending imperceptibly and thus producing a pleasing and harmonious effect. It has been successfully cut and polished by the Drake Company, of St. Paul, Minn., who saw and polish large surfaces of hard material better than can be done anywhere else. Its extreme hardness and its richness of colour will always recommend it as a high-priced ornamental stone.

A curious white, opaque variety of opal, known as hydrophane, has been found at some Colorado localities. It possesses the remarkable property of displacing twice its bulk of water, and then from opaque white it becomes perfectly transparent. The finder proposes the name "magic stone," and suggests its use to conceal photographs, hair, or other objects which the owner wishes to display only as his caprice dictates. This stone is identical with one known as oculus mundi, world's eye, or lapis mutabilis, described by De Boot, De Laet, and Boyle, in the sixteenth century, and which was evidently tabasheer, an organic opal that forms in the joints of the bamboo. It is undoubtedly the snake-stone of the Buddhist priest. Tavernier, in his travels, states that the source of these stones was unknown, but says they clove to the roof of the mouth, and when dropped in water they caused the water to boil—in other words, air in bubbles would leave the stone and would ascend to the top of the water.

What may prove to be of considerable use in the arts, and as an ornamental stone, is the banded jasper, found in Graham County, Kan., which is beautifully banded like an onyx, in red, yellow, brown, white, and other colours. Pieces a foot long, and six to eight inches thick, can be taken out. As a banded jasper, it is unrivalled in the whole world.

The small brilliant rutile crystals from Alexander County, N.C., have furnished perfect black gems, which approach the black diamond more closely in appearance than anything else known.

The well-known labradorite rock of Lewis County, N. Y., is so plentiful that the reflection of the boulders has given the river that runs through the locality the name of Opalescent River. This is being extensively cut as an ornamental stone.

Pearls are lustrous concretions, consisting essentially of carbonate of lime interstratified with animal membrane, found in the shells of certain mollusks. They are believed to be the result of an abnormal secretory process caused by an irritation of the mantle of the mollusk, consequent on the intrusion into the shell of some foreign body, as a grain of sand, an egg of the mollusk itself, or perhaps some cercarian parasite. It has also been suggested that an excess of carbonate of lime in the water may cause the development of the pearl. Accepting the former theory as the more probable one, it is easy to understand how this foreign body, which the mollusk is unable to expel, becomes encysted or covered as by a capsule, and gradually thickens, assuming various forms—round, elongated, mallet shaped—and is sometimes as regular as though it had been turned in a lathe. It has been suggested that the mollusk continually revolves the enclosed particle in its efforts to rid itself of the irritation, and that this accounts for its roundness, and that the revolving is due to a natural motion which is accelerated by the intruding body.

In regard to the formation of pearls, the following statements may be made. Whatever the cause or the process of their production, these interior concretions may occur in almost any molluscan shells, though they are confined to certain groups, and their colour and lustre depend upon those of the shell interior, adjacent to which they are formed. Thus, the pink conch of the West Indies yields the beautiful rose-coloured pearls, while those of the common oyster and clam are dead white or dark purple, according to their proximity to the part of the mantle which secretes the white or the dark material of the shell. The true pearly or nacreous iridescent interior belongs to only a few families of the mollusks, and in these alone can pearls proper be formed at all, while, in point of fact, they are actually obtained only from a very few genera.

According to Dr. William H. Dall, none of the air breathing mollusks (the land snails) produce a nacreous shell; and among fresh water mollusks, none are pearl bearers except certain of the bivalves, notably those belonging to the groups, appropriately called the naiades, of which the common river mussel (*Unio*) is a typical example. The soft internal parts of these mollusks are covered by a thin, delicate membrane, called the mantle, from the surface, and particularly from the outer edges, of which material is excreted to form the inner layers of the shell. The shell consists of two parts, the epidermis and the shell proper, the latter composed of numerous layers. The epidermis, which resembles horn, is chiefly composed of a substance called "conchioline," and is soluble in caustic alkalies.

(To be continued).

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

(Continued from page 54).

OF all branches of Gemology the mathematical must necessarily be the dryest, and uninteresting to the general reader; and were it not for its paramount importance I would banish it entirely from our notice. But no sooner do I attempt to do this than the ghost of a thousand crystals of quartz, calcite, and other practically worthless minerals arise before me, which people more or less identified with the trade have from time to time submitted to me under the impression they were diamonds. One man with whom I was pained to be brought into contact in New Zealand, positively sold his business to buy up some land which contained some small perfect doubly-terminated crystals of quartz under the idea they were diamonds; to him, unfortunately, crystallography was a myth, and crystalline forms as meaningless as long-named. Nor is this state of things confined to the colonist. I well remember an instance when an officer of high rank, at the fall of Delhi, became the happy possessor of a magnificent crystal which "for ages had been looked upon as one of the finest uncut rubies in India." We can form some idea of his delight with a gem with such a pedigree, and to what measure it compensated all hardships he had undergone in his years of foreign service, and the amount of consolation he afterwards felt in his retired life at the thought of how handsomely he should leave his widow endowed if only the gem were left her. Buoyed up with this idea economy was obscured from his thoughts, while his rate of living upon a foreign-service-broken constitution made such havoc that in a very few years his widow found herself nearly alone with her gem. Then came a moment of bitter anguish—the gem must be sold; so accordingly she took it to a well-known jeweller, who had often heard the officer boast of its possession, and who was just as pleased to secure such a gem. Whilst bargaining for it, however, an assistant who knew something of crystallography saw it and immediately exclaimed, "but that is no ruby—it is a very fine elongated rhombic-dondecahedron of garnet;" and it was only upon producing a copy of *Dana's Mineralogy* with the figure engraved as that of a garnet that the gentleman could be induced to believe that all the world had been so deceived for so long a time.

These are only two instances of many that I could quote, and as I mention no names I hope no offence will be taken by any of the *dramatis personæ*. I should not have quoted them now were it not to impress upon my readers the importance of this seemingly uninteresting branch of the study.

We have previously referred to the fact that in virtue of a force or forces operating in nature, molecule lays itself to molecule in such unerring precision, that definite geometrical forms are produced, which forms are characteristic of the gem that produces them. Now although there are thousands of these forms, it has been mathematically shown by crystallographers that they can all be reduced to six *systems*, and that although each species of mineral, or gem, may occur with a very great number of different outlines, every one of these are referable to one system, and to one only, which will be known as the system under which the specific gem crystallizes. But it may be worth while to remark at the outset that the two most difficult systems can be passed by unnoticed, no gem of any importance occurring in either of them, and that the four simpler ones only demand our attention. But it is rather unfortunate that a number of men in different countries have applied themselves to the reduction of these forms to a systematic arrangement, and that approaching the subject from various points, whilst there is a general agreement in the number of systems, etc., several of them advocate different names for each of the six, and so with that characteristic English custom one is allowed to take his choice. The nomenclature that we will employ will be that of Dana, viz.:—

I. Isometric.
II. Dimetric.
III. Trimetric.
IV. Monoclinic.
V. Triclinic.
VI. Hexagonal.

But before proceeding further it may be advisable to give some definitions of terms employed:—

Planes or *faces* are the surfaces that bound the crystal, irrespective of their shape or direction, whether curved or straight. They may be—

(*a*) *Triangular*, *i.e*, bounded by three straight lines, and, according to the respective lengths of these lines may be *equilateral*, *isosceles*, or *scalene* triangles.

(*b*) *Square*, *i.e.*, four equal sides, all at right angles.

(*c*) *Rectangular*, *i.e.*, four-sided, opposite sides only equal, and angles right angles.

(*d*) *Pentagonal*, *i.e.*, five-sided, which in the regular pentagon are all of equal lengths and angles.

(*e*) *Hexagonal*, *i.e.*, six-sided, which in the regular hexagon are all of equal lengths and angles.

(*f*) *Octagonal*, *i.e.*, eight-sided. In the regular octagon sides and angles are also equal.

(*g*) *Rhombic*, *i.e.*, all sides equal, but angles not right angles.

(*h*) *Rhomboid*, *i.e.*, opposite sides only equal, and angles not right angles.

(*i*) *Deltoid*, *i.e.*, a four-sided figure, one of whose diameters will divide it into two equal scalene triangles, and the other into two unequal isosceles triangles.

(*j*) *Trapezoidal*, *i.e.*, a four-sided figure with no two sides parallel.

Solid figures also come from the same roots, used with the Greek affix *hedron;* thus a

Tetrahedron is a four-faced solid figure.

Hexahedron is a six-faced solid figure.

Octahedron is an eight-faced solid figure.

Trapezohedron is a solid figure whose faces are trapezoids.

Doudecahedron, a twelve-sided solid figure. This last may be prefixed with the faces, as

Rhombic-doudecahedron, *i.e.*, a twelve-sided solid figure, each of which face is in the shape of a rhomb.

Pentagonal-doudecahedron, *i.e.*, a twelve-sided solid figure, each of which face is pentangular.

Numerical prefixes are also employed, as *triakis-* and *hexakis-octahedron*, or *tetrahedron*, meaning a three- or six-faced octahedron or tetrahedron.

Of the solid figures, the two that concern us most are the *prism* and the *pyramid*. The *prism* consists of two sides or ends which are of the same shape and size, and are parallel, upon which the figure is built, one of which is called the base, and planes parallel to it *basal planes*, and a varying number of rectangular faces or sides.

The *pyramid* consists of a number of faces usually triangular, inclined to each other, running from base to point, and may be either *single* or *double*. Prisms are usually terminated by pyramids, which may also be either single or double. Usually the prism maintains the straightness of its sides until it is capped by the pyramid, as in the case of the amethyst, topaz, tourmaline, etc.; but in other cases, such as some of the corundums, the sides come up in a curve, which springs from a certain point in the prism, the colour changing very often at the same time. Usually they become darker towards the apices; often, or generally, a prism starts with white milky sapphire, passes through white sapphire and ends in ruby, or commences in yellow sapphire and ends in blue. Sometimes all colours are indiscriminately mixed; at others, they alternate.

It is the shape and position of the faces that give to crystals their form and outline, but it is their relative positions, irrespective of their shape or size, by which they are systematically determined. Now to express exactly the relation which these faces bear to each other, certain cardinal lines are supposed to run through the types of each system called their *axes*, and each plain is measured by its relation to these axes. Let us take, for example, the isometric system. In this there are three axes shown by the dotted lines (Fig. 1), all lying at right angles to each other, crossing in a point called the centre. Now, as its name implies, in its typical form the octahedron (Fig. 1), each face is seen to cut each of these axes at the same distance from the centre. It therefore follows upon consideration that the outline of the crystal need not necessarily be bi-laterally symmetrical. If any plane be built up around these axes so as to cut all three at equal distances from the centre, that face will be an octahedral face; and if the adjoining octahedral face be present the angle between the two will be constant. Let us take for example the great diamond known as the Nizam. (I do not mean the facetted model that Captain Fitzgerald made of it upon hearsay, and afterwards repudiated, but which is nevertheless often shown in collections side by side with the smaller true model, like two churches that are said to claim to show a skull of St. Peter, one much smaller than the other, getting over the difficulty by proposing that one was his skull when a boy, the other when he was a man; in the case of the models, however, no explanation is offered!) In the uncut model you may see vestiges of four planes, two very much longer than the others; but notwithstanding this discrepancy of size, and the fact that the top is an edge over an inch long where it ought to be a point, a little reflection will show that like the faces of a perfect octahedron built up round three axes at right angles, joining its solid angles, so these faces would cut each of the axes at equal distances from the centre, and are therefore octahedral faces; and as there is no other transparent colourless mineral that would occur in this form save spinel, salt and alum, and as a touch of the tongue would reduce its possibilities to two, and *physical properties*, to be subsequently described, preclude its being a spinel, had we found those children playing with it in whose hands it was first found, we should have known it was a diamond without attempting to break it.

The Isometric System.—The Crystallography of the Diamond.

There is one system of crystallography about which much more must be said than all the rest put together, viz., the Isometric, for in various forms of it occur the diamond, the spinel, and the garnet, each, however, being characterised by putting on different members and modifications of the system, as will be seen hereafter.

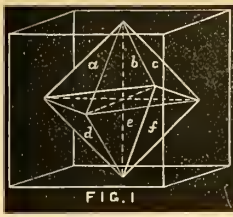

FIG. 1

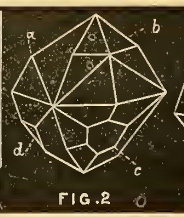

FIG. 2

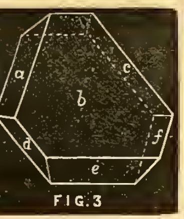

FIG. 3

Simple Forms of Crystals.—Fig. 1 shows the primitive forms of this system, the octahedron inside the cube; together with their relation to the axes of the system, represented by the dotted lines.

Now although the regular octahedron is employed as the symbol of the rough diamond on sign boards in South Africa, this form is by no means its exclusive one; still many and beautiful crystals of this form, with faces as smooth and highly lustrous as to require no touch of the polisher, do occur; and when so occurring have been employed from time immemorial for setting. But the angles which they form are not those which are demanded to bring forth the optical properties of the gem, to say nothing about the awkward shape they would present for setting, as there would be as much above the girdle as below: and further the angles from face to face at the girdle being 109° 28′; they are much higher than broad.

There are probably a thousand perfect octahedra for every perfect simple cube.

Faces upon Simple Forms.—One of the first divergencies of the octahedron is that caused by the building up three or six triangular faces upon each of its eight faces, giving rise to the *triakis-* and the *hexakis-octahedron.* Fig. 2 is a diagram to illustrate some of these modifications; on face *a* is shown three faces so built. A lovely example of a triakis-octahedron was afforded by the well-known Stewart diamond. At side *b* is shown six sides similarly built as in the hexakis-octahedron; this is a very common form of diamond, and was indeed regarded by Haidinger as the characteristic form, and by him called the adamantine in his system of crystallography.

Sometimes the three faces of the triakis-octahedron have their central points of union cut off by a three-sided figure lying parallel to the original octahedron, as shown at *d*, Fig. 2; and a similar combination often obtains with the hexakis-octahedron as shown at *c*. There is a very peculiar tabular form of diamond, the shape of which is as though one had cleaved off two of these seven-sided faces and stuck them together. Several of these forms are in the National Collection, Natural History Museum, Mineralogical Department, Case I.

Returning to the cube, Fig. 1, not only do we find diamonds occur as cubes, but the cube itself is also subject to a similar building up of faces upon each of its six faces, and entering into combinations of simple and facetted forms similar to the octahedron.

Combinations of the Cube and Octahedron.—The next series are those arising from combinations of the cube, either simple or facetted, with the octahedron, either simple or facetted, or both, or all; and to add to the apparent complexity the faces need not necessarily be of the same size as in the primitive forms: any of the faces may be greatly developed at the expense of its neighbours. Two things alone are constant—the angles which they make with each other, and their necessary relation to the imaginary axes of the crystal. Distortion along any given plane or the development of any one set of faces may occur to such an extent that a figure of, say, a simple octahedron may be so altered as to bear no ostensible relation of outline to the primitive form. Fig. 3 shows the outline of a spinel now before me, with some planes more developed than others, and although so strange a form results from this over-development it is in reality the same form as in Fig. 1, the corresponding faces of which I have lettered similarly; as would very readily be seen after a little practice, especially in a simple case like this, for as we previously observed, when octahedral planes meet each other they always form at the girdle an angle of 109° 28′, and at the apex 70° 32′, and if the eye could not be trusted, recourse could be easily had to the goniometer.

Hemihedral Forms.—When all the faces of the figure are present, they are called *holohedral forms*, but as there is no limit to the developing of the size of the faces only their meeting with others, it becomes evident that by the further developing, as in the last figure, of half the faces, the other half may become entirely obliterated, giving rise to what are known as *hemihedral forms.* Fig. 4 shows a tetrahedron, it is the hemihedral form of the octahedron, and is originated by the development of half the octahedral planes to the extinction of the others; and like the octahedron it may have other faces built up upon its four faces, and may occur either simple or facetted, in combination with any of the foregoing and some subsequent forms. We might, however, observe that the three-faced and six-faced tetrahedrons are not both the hemihedral forms of octahedrons, the three-faced being the hemihedral form of the deltohedron, and the six-faced is the hemihedral form of the six-faced octahedron, by taking alternate groups of faces; whilst the taking of the alternate groups of faces in the three-faced octahedron results in a twelve-sided figure, each of which is a deltoid, and called, therefore, a deltoid dondecahedron. In these four hemihedral forms no two faces are parallel, but in the following two, faces exist in parallel pairs: the first is a twelve-faced figure, each of which is a pentagon, therefore, called a pentagonal doudecahedron; it is the hemihedral form of the four-faced cube. The next is a twenty-four trapezium-faced figure, called a trapezohedron, and is another hemihedral form of the six-faced octahedron, derived by the development of alternate planes. The hemihedral forms bridge over and connect different members of the system which otherwise seem to bear little or no relation to each other, which are known as the limits of the form; thus the three-faced tetrahedron bridges over the tetrahedron and the cube. The deltoid doudecahedron, the tetrahedron and the rhombic doudecahedron. The six-faced tetrahedron, the trigonal doudecahedron, and the deltoid doudecahedron. The pentagonal doudecahedron, the rhombic doudecahedron and the cube. When we study these forms in relation to the axes, the difficulty becomes reduced to a minimum, and I might say, possibility, it being nearly impossible to read them without. Figures of some of these will be shown later on.

In proportion to the increase of number of faces in the diamond so it becomes less angular and more rounded in outline, which coupled with a peculiarity enjoyed by the diamond to often show more or less curvature of its faces, the result is that they are generally more or less rounded or oval in outline; before me is one as nearly round as possible, and another is in the National Collection. The reason why I have felt it advisable to be what to some, I fear, may appear tediously long on this, the dryest part of the subject, is, that we may more thoroughly grasp the different physical and other properties to be subsequently described under cleavage structure, etc.

There is one form of structure that obtains in diamond crystals, viz., the occurrence of small equilateral triangular depressions pointing towards the girdle generally about 1mm. to 3mm. in width. These have for a long time been an enigma to mineralogists, both English and Continental. Gustav Rose, after experimenting for a long time, came to the conclusion that they obtained on crystals which had been subjected to intense heat and pressure, and consequently the South African diamonds were formed under similar conditions: when however I noticed the same markings on diamonds from Brazil, India, Australia, and Borneo, I began to look for another explanation, and by micro-goniometric measurements I found these angles to be those of the inscribed cube within the octahedron, so that these triangular markings which have been such a puzzle for years I have now no hesitation in saying are merely abortive attempts on the part of the octahedron to put on faces of the cube.

The following is a list of the principal forms under which the diamond can crystallize.

Octahedron. Triakis- and *hexakis-octahedron.*—Combinations of the former with each of the latter.

Cube. Four-faced and *Six-faced Cubes.*—Combinations of the former with each of the latter; combinations of the simple cube with the simple octahedron; of simple cube with facetted octahedron; of facetted cube with facetted octahedron.

Tetrahedron. Facetted tetrahedron.—Combinates with each other and with the foregoing.

Rhombic-, deltoid-, and *pentagonal-dondecahedrons.*

Trapezohedron.

Deltohedron.

With occasional twins and macles and generally with more or less curved faces. Such is the medley of forms that crystallographers refer to this *system*, and that the simplest of the six! To my mind there is only one thing more wonderful than this diversity of forms, and that is the ease with which they can be recognised when once thoroughly understood.

(To be continued).

A Bridge of Agate.

By George F. Kunz.

AMONG the great American wonders is the silicified forest known as Chalcedony Park, situated eight miles south of Corrizio, a station on the Atlantic and Pacific Railroad, in Apache County, Ariz. The country formation is sandstone on volcanic ash, and the trees are exposed in gulches and basins where the water has worn the sandstone away, or are buried beneath the sandstone, their ends protruding from between the formations. The locality was noticed in 1853 by the Pacific Railroad Exploring Survey. The jasper and agate generally replaced the cell walls and fibres, and the transparent quartz filled the cells and interstices, especially where the structure was broken down by decay. These cell centres and cavities produced conditions favourable not only for the deposition of silica as quartz, but also for the formation of the drusy crystalline cavities of quartz and amethyst that so increase the beauty of the material.

There is every evidence to show that the trees grew beside some inland sea. After falling they became water-logged, and during decomposition the cell structure of the wood was entirely replaced by the silica from the sandstone in the walls surrounding this great inland sea. Major John W. Powell, who has visited all these regions, says: "The wood consisted of logs water rolled before burial, and are now gradually weathering out of their matrix. The inclosing rock is sandstone and cretaceous shale, of the series known as Jura-trias and lying immediately above the Chinarump. Agatized wood containing much semi-opal has been formed in California (and possibly in Arizona) under volcanic deposits, but the wood in question is not associated with volcanic material; its matrix is sedimentary."

The red and yellow colouring matter is derived from the oxide of iron in the sandstone, which is red, and the black may be due to partial carbonization or to oxide of manganese. The bark in nearly every case has been decayed before silification, and even part of the other layers of the tree is often gone, but the difference between the oxidation on the surface and inside is that the surface to the depth of half-an-inch is so altered and changed that it has the appearance of bark, and is generally supposed to be such.

There is every indication that the deposit is of considerable depth. Over the entire area trees lie scattered in all conceivable positions and in fragments of all sizes, the broken sections sometimes resembling a pile of cart wheels. A tree 150 feet in length is often found split into as many sections of almost uniform length, presenting the appearance of having been sawn asunder for shingle blocks by some prehistoric forester, or broken into countless fragments, ranging from the size of a small pebble to that of a fair-sized boulder, also fractured into perfect shaped cubes, as if cut by a lapidary. These multiplied fractures are the result of alternate heat and cold, produced by atmospheric changes acting on the water in the fissures of the tree.

A phenomenon perhaps unparalleled and the most remarkable feature of the park is a natural bridge formed by a tree of agatized wood spanning a canon 45 feet in width. In addition to the span fully 50 feet of the tree rest on one side, making it visible for a length of over 100 feet. Both ends of the tree are embedded in the sandstone. It averages three-and-a-half feet in diameter, four feet at the thickest part and three at the smallest. Where the bark does not adhere the characteristic colours of jasper and agate are seen. Although the wood is beautiful to the naked eye a microscope is needed to reveal its greatest charms; not only does the glass enhance the brilliancy of its colours, but it renders visible the structure, which has been perfectly observed, even to the forms of minute cells, and is more beautiful now than before the transformation. Dr. P. H. Dudley examined microscopically some sections of this wood, and found that part of it, at least, belongs to the genus Araucaria, one species of which, *Araucaria excelsa*, the Norfolk Island Pine of the South Pacific Ocean, according to the same authority, grows to a height of 100 to 200 feet. Other portions were found to resemble our red cedar, *Juniperus Virginiana*, when grown in the extreme South. The cell structure of some of the wood indicates growth in a mild, uniform climate, the annual rings being marked by only one, two, three or more slightly smaller hexagonal or rounded, not tabular cells, as is usually the case. The name of "Chinarump" has been suggested for this material by Major John W. Powell, this being the Indian name for the substance.

These trees, according to one of the Indian myths, were believed to be the bolts of the arrows used by their god. It has been extensively used by them in making spear and arrow points.

Spoons for Collections.

ONE of the daintiest fancies for birthday gifts is a collection of "Harlequin" spoons. Already the large American manufacturers have, according to the Chicago *Tribune*, recognised the fad, and are making a large number of quaint designs for this purpose, which are sold singly. The value of such a collection rests in the fact that they are gifts from friends and consequently are all different—as it is desirable that the spoon should have a characteristic design of its own representing the taste of the giver. A coffee spoon costs from a dollar to a dollar and a half, unless it is an elaborate Russian enamel, when it would represent a value of $2 or $3 in extra work. The same amounts of money are often thrown away in trashy birthday gifts, which last but for the hour; but such presents as these represent a genuine value, for spoons are spoons, whatever their design. The old Medici design (the handle surmounted by the capped head and peaked nose of the famous family); Queen Anne designs; early English patterns, Gothic in idea; and Louis XIV. designs with much polished surface bordered by the rococo scroll, are all among the elaborate patterns in spoons. There are also Japanese patterns, classic designs; Moorish silver, like that shown by Tiffany in his exhibit at the late Paris Exhibition; the enamelled Russian silver, etc. The flower designs in spoons are especially beautiful. The Japanese chrysanthemums, the national flower of that Eastern empire, is one of the most graceful designs for spoon handles; but a myriad other flowers are also used by designers with excellent effect. The value of the Harlequin spoons is enhanced by their being engraved on the back with the initials of the givers combined with those of the owner. These gift spoons are usually coffee spoons. The souvenir tea spoon is another idea by which tourists recall the pleasant stopping-places in their summer travels. These are not gift spoons. They are purchased by the fair traveller, each one at a different city, the name of the city being engraved on the back. Manufacturers have already in market spoons engraved with the names of different cities to meet this fad. Sometimes a characteristic etching follows the name. The Boston spoon has a little smoking pot of baked beans after the name of the city.

The Value of Silver.

DURING the years 1888 and 1889 the price of silver bullion in the London market averaged little over 3s. 6d. per oz standard. The price is now 4s. 6d. per oz., and the rise has been nearly 30 per cent. in a short time. It is notorious and beyond doubt that the advance has been caused by a feeling that the compulsory purchases of the United States Treasury, under the Act which came into force last month, will reduce the supplies of silver. It is far more doubtful whether, as the price of silver rises, production will diminish rather than increase, and whether the ordinary laws of supply and demand will not operate. The contention of the silver interest—of which the bimetallists are an important section—is, according to a recent writer on the subject—1. That silver is only a "bye-product;" that it is produced because gold or baser metal is mixed with silver as it lies in the earth, and that silver has been sold for what it was worth because there would be waste in not selling it. 2. Another contention is that silver will rise further because, now that it is worth an advanced price, the great mines will not be worked so fiercely as before—that the owners will be satisfied with a small production, so long as a small out-turn suffices to pay working expenses. Both these contentions appear flimsy and paradoxical, and as is shown sufficiently below, the general commercial demand for silver tends to decline: but still the rise in silver is a hard fact.

At present it is useless to enquire whether the rise has been "engineered" by a combination of powerful speculators, or whether it is rather the result of a diffused belief in the stability of the market, without any conscious combination whatever. The extra purchases so far made for storage in the American Treasury could not have caused the rise, apart from its effect on the opinion of the market, for the additional official absorption by the United States is to be about two million ounces per month, and the new demand has been only three weeks in operation. One million ounces drawn from an annual production of 100 million ounces could not have been the sole cause of the rise of 30 per cent. in the value of silver. The rise is the result of "opinion" or combination.

At the same time the root of the rise and of the change in the opinion of the market is to be found in the American demand for storage purposes. The history of recent legislation is too fresh to be referred to at length. Certain silver men and inflationists impressed on their fellow legislators the benefits to be got from an idea. "Let us pretend," they said, "that sixteen ounces of silver are equal to one ounce of gold. The Legislature of a great country like ours can, with the proverbial exception, do anything. If we cannot change a boy into a girl, we can to some extent transmute silver into gold." The attempt was made and, with the limitation to 4,500,000 ounces per month, the process now at work is described by an American paper thus: "The new silver certificates are out, and the first payment of them from the Sub-Treasury was made on the 19th inst. The Consolidated Kansas City Smelting and Refining Company received from the Philadelphia Mint a cheque for $56,600 in payment for 50,000 ounces of silver sold to the Government August 13, the first day on which the law went into effect. It was soon after presented at the Sub-Treasury by the secretary, Mr. Brush, who was paid in one-thousand-dollar certificates numbered from A1 to A56 inclusive. The certificates have on their face the promise that the Government 'will pay the bearer $1,000 in coin,' and Mr. Brush, to test the practical working of the law, immediately presented one of them for redemption. He was told that the Secretary of the Treasury had given orders to redeem the certificates in either gold or silver coin, at the election of the holder. At his request he received a gold certificate instead of the coin."

Thus, the Treasury of the United States gives gold money for silver or is under liability to do so, and the transmutation is practically complete for the moment. How long the process can go on, and under what special circumstances, after a certain limit has been passed, it can exist without disaster we have yet to see by experience. Bimetallists are charmed with the effect of the new American legislation on the value of silver so far. The more enthusiastic consider that it is now "shown conclusively that Governments can regulate the money value of this commodity. As it is impossible to distinguish between the effect of a Government demand and of a private demand, both being equally strong, persistent and widely advertised, nothing fresh whatever has been shown. It would be a mistake to suppose that the experiment has any connection with the revival of bimetallism. This is impossible. Even under the Latin Union what was fondly imagined to be bimetallism was monometallism —the standard of the cheaper metal. It is true that, as long as the mints were open, there was always a demand for silver for conversion into the coins used in the Latin countries, and that demand happened to keep up the value of silver within a little of the value assigned to the metal by the Union. Bimetallism, in so far as it meant a double standard, did not and cannot exist. The American demand also is an effective one: it reduces the supply, and acts on the opinion of the market because it is a large, persistent and well-advertised demand for so much silver in exchange for gold. As yet there is no fear of that shuffling which is known as practical bimetallism, in the United States, and gold is in practice the standard of value for silver as for other exchangeable things. Were it believed two years hence that the Government of the United States would not go on using its credit and resources for the purpose of paying gold, the American demand for silver would cease to be effective.

With the great and sudden fluctuation in the value of silver witnessed this year there has been some natural rise in the gold value of articles purchaseable with silver. Wheat and Mincing Lane produce, imported from the silver-currencied countries of the East, have gained value. Producers in the East can therefore "write up" the value of assets (if their accounts are kept in gold). On the other hand, Eastern importers of Manchester goods think they cannot go on paying high prices in silver. The rupee is now worth more than a twelfth part of a pound sterling, instead of only a fifteenth part. According to a Manchester newspaper, "the suddenness of the advance has, for the moment, tended to disorganise the Eastern trade at its weakest points, and especially at Calcutta. In that market the native distributors are, as a rule, financially much less strong than those at the other ports, and they have been allowed by importers to enter into contracts for forward delivery to an extent not justified by their apparent means. A sort of panic has consequently seized upon them, and they have resolved not to accept delivery of goods which they had ordered except at a considerable reduction of price. The importers have endeavoured to agree upon a uniform method of dealing with these claims for abatement, but so far without success. Meanwhile the difficulty has undoubtedly interfered seriously with the Calcutta trade." The promptitude —the discreditable eagerness—of native buyers to share with English manufacturers the benefit of the rise in exchanges must hamper trade. India cannot afford to buy Manchester goods freely, silver being now comparatively dear, unless Manchester makes a concession; nor will India and the East generally be able to absorb silver so freely as before. While the artificial Government demand for silver in the West increases, the natural commercial absorption of the East tends to decrease.

It is remarked above that the expectation of a diminished production of silver by the more enthusiastic bimetallists rests upon paradox, and that is obviously uncertain ground. Other things being equal, it is certain that the East cannot afford to absorb so much silver, or so much merchandise bought with silver as before. After the first rush to forestall a rising market we shall have a better opportunity to examine the tendencies at work to augment production generally, and to diminish the Eastern absorption of silver. America, for its own sake, would have been better advised to let silver remain in the ground until a natural demand arose. The damage done outside that country by a sudden and great fluctuation in an article like silver—a standard of values—must be widespread. Moreover, counter fluctuations must be expected in the future.

The Care of the Eyes.

CAPTAIN MARRYAT has justly said: "A man may damn his own eyes, but has no right to exercise a similar prerogative over other people's visual organs;" and, while a Chicago contemporary does not presume to "damn" at all, it proceeds in the following interesting article to endeavour to lead those who are suffering from remediable ocular defects—enduring the inconvenience, the headaches, and other afflictions which such defects occasion—to conduct, as it were, their visual organs through the courts of retributive justice, so that if they have given trouble, they may not only be sworn at, but also indicted, condemned to trial, and sentenced to proper correction.

Throughout life, from youth to old age, there is a process of change occurring in the refractive media of all eyes, so that every one who attains to a ripe old age will, at some time or other during his or her existence, be a fit subject for the oculist—or, in other words, will need to wear glasses. In young people this change is usually gradual and unperceived, but from middle life onward its effects are plainly apparent. Those who have normal vision while young will require glasses for reading when they have passed beyond the age of forty, and those who are near-sighted before the age is reached, need glasses in early life, if the degree of near-sightedness (myopia) be at all great, and yet they may be able to read perfectly well without glasses when fifty, or even sixty, years of age. Persons who are included in this category are apt to consider themselves as lucky exceptions to general laws, and are usually very proud of their sharp sight.

But not only does the eye undergo certain normal changes as age advances, but it may be abnormally formed; and hence optical defects are not only possible, but quite common in infants. The eye is a camera, and, while it may be free from disease and perfectly sound, still vision may be bad because the rays of light are not focussed upon the retina. Hence comes the necessity for wearing glasses, for, by placing suitable lenses before these eyes, normal, distinct vision may—within certain limits—be obtained. It is not generally known that it is the exception, and not the rule, to find eyes that are perfect in shape, or, technically speaking, that are "emmetropic." Still it does not follow that all eyes that are not perfect in shape should have glasses fitted to them, for some errors of refraction do not interfere seriously with vision, and never give rise to disease or decided discomfort to the patient; but, as a rule, persons whose eyes are "weak," or who suffer from complaints similar to those which we shall soon consider, should present themselves to some competent oculist for the detection and subsequent correction of any existing errors of refraction. Let me briefly say that by "competent oculist" is meant one who has not only a knowledge of the delicate mechanism of the eye, but of the other organs of the body as well; for abnormalities and diseases of the eye link themselves very closely to deseased conditions of other portions of the physical economy. Consequently, the competent oculist is a doctor of medicine, although he may devote himself entirely to the study and practice of ophthalmology. The jeweller is not always and the peddler is never a proper person to fit glasses; and, while it is true that certain opticians are conscientious enough to send the party to an oculist when they find that they cannot correctly fit a patient with glasses, still there are opticians who are less conscientious, and who, lest the acknowledgment of incapacity might lower their standard in the public mind, or cause the loss of a customer, advise glasses which are not correct in every respect. Moreover, the oculist has means at his command for the detection of errors of refraction which cannot be applied by the optician, and possesses a knowledge of the proper correction of these errors which years of study and experience can alone bestow.

There still exists quite a prejudice in the minds of many against the use of glasses; but why such prejudice should exist is very difficult of explanation on any other grounds than wilfulness and ignorance. All ophthalmologists teach the great necessity of correcting errors of refraction by wearing proper glasses, and we shall herein endeavour to show some of the undesirable, and even portentous, results of permitting optical defects to go uncorrected. As a rule, glasses add nothing to the appearance of the wearer, and they are often a source of inconvenience, and, unless there is a definite object to be attained by their use, patients are better without them; but where they are indicated and advised by one competent to decide, neither vanity nor prejudice should prevent their being employed.

The purposes for which glasses should be prescribed may be briefly summed up thus: First, to prevent disease of the eyes from "eye strain;" second, to aid in the curing of certain diseases and abnormal conditions, by releasing all strain and giving the eyes rest; third, to enable the patient to better pursue his avocation in life; and fourth, for his comfort and convenience. Our consideration of these items must necessarily be brief, and, consequently, imperfect. The first two are of paramount importance, and afford material for many chapters in the study of refraction. In general, it may be said that all errors of refraction which reduce the patient's vision to any extent below the normal, or which produce any marked change in either the near or the far points, require correction by the use of suitable glasses. These errors are: *hyperopia*, or far-sight; *myopia*, or near-sight; *presbyopia*, or old-sight; and *astigmatism*, or irregular sight.

Let us first consider the dangers from hyperopia. There is a constant strain, known as "an effort of accommodation," upon every far-sighted eye when viewing both near and remote objects. This effort of accommodation is a muscular exertion, and hence a tax upon the nervous system, and, if long continued, results in more or less exhaustion. When far-sighted eyes are used for reading or near work for any considerable period of time, the effort required produces congestion and redness of the eyes, a larger flow of blood is sent to them, and hence there is an increased secretion of muscus, or "watering of the eyes;" and, if the work be still continued, dizziness, headache, a feeling of sickness, or even actual vomiting, may be induced. But in far-sighted children another condition not infrequently arises as soon as they are made to apply themselves to books. A child begins to have a cast in the eye—that is, to squint, or look "cross-eyed." At first the squint may be periodic, and appear only when close work is undertaken; but unless means are employed to prevent it, it soon becomes permanent. In the great majority of cases, internal squint is due to hyperopia. An excessive effort of accommodation is always associated with increased convergence, and, as a far-sighted eye must always increase its accommodation in order to gain clear vision, it naturally squints inward. Nervous twitchings of the eyelids and other portions of the face are sometimes occasioned by hyperopia. Fortunately, the condition of hyperopia can be easily corrected by suitable convex spherical glasses, and thus the conditions of weariness and exhaustion of the eyes, catarrh of the eyes, twitching, headache, etc., can be prevented; or, where they have already occurred as consequences of long sight, they are usually at once and permanently removed as soon as the hyperopia is corrected by appropriate glasses. Squint is also thus prevented by glasses, and in a certain number of cases where it is already manifested in children, it may be remedied by correcting the existing error of refraction.

Myopia, or short sight, is often hereditary or congenital, but may be acquired from prolonged straining of the eye. This condition is not infrequently the precursor of serious, and sometimes irremediable, impairment of vision, and hence skilled advice and proper glasses are of highest importance to the patient in preventing the accidents to which every myopic eye is liable. In high degrees of myopia there is an excessive demand made upon the muscles that converge the eyes, in the efforts made to keep them both fixed upon small objects held close to the face, and sometimes, being unable to withstand this strain, they give out, and one eye is then turned outward by the opposing muscle, forming a divergent squint. Very serious intra-ocular changes, that are beyond the reach of therapeutic measures, are sometimes occasioned by high degrees of myopia. Short-sighted eyes, above all others, require the most rigid hygiene.

The vision should be rendered normal—except in very high degrees—by the use of concave spherical glasses, and everything which tends to congest the eyes—such as reading or writing in the recumbent or stooping posture, or by faulty light—is to be most carefully avoided.

Presbyopia, or the far sight of old age, is caused by a lack of power of accommodation, and although distant vision remains unimpaired, there is a constant recession of the near point. This is first noticed by the patient when he finds that he is obliged to hold his paper farther away from his eyes than before, and that the print is not so clear as formerly. Presbyopia is easily corrected by convex glasses for reading, and they should be employed as soon as the affection becomes manifest. It does not usually cause inconvenience until after the age of forty. Far-sightedness, when not corrected by appropriate glasses, causes the condition of presbyopia to manifest itself earlier in life than it does in eyes not thus affected, or in those in which the error has been properly corrected.

In astigmatism, or irregular sight, the refraction differs in different portions, or meridians, of the eye, and the retinal image is thus confused. This condition is usually congenital and may be hereditary; it is, however, sometimes acquired, often occurring after inflammations of the cornea, and may even be occasioned by the use of improper glasses. It is a very common optical defect, and is corrected—according to the variety—either by cylindrical lenses or by combining cylindrical with spherical lenses. Irregular astigmatism cannot be entirely corrected. As astigmatism is either a variety of hyperopia or of myopia, or a mixture of both, it can be productive of the train of symptoms already shown to be occasioned by these errors of refraction—such as headache, dizziness, nausea, and nervous irritability—and consequently, in all varieties of astigmatism, suitable glasses (preferably spectacles) should be worn continually, for both distant and near vision.

A different refractive condition in the two eyes of the same person is quite common. One eye may be correct, and the other long-sighted or short-sighted; or they may have different degrees of the same defect; or, again, one eye may be long-sighted and the other short-sighted. And since, in such cases, the condition of one eye can scarcely be improved by the same glass adapted to correct the error in the other, the vast impropriety of selecting glasses at random from the counter of a dealer is plainly obvious. Both eyes must be tested separately, and fitted accordingly. Where it is known that presbyopia—the condition due to age—alone exists, patients may select their own glasses, for at any given distance, according to the needs of convenience of the patient. As age advances, the amount of presbyopia increases, and new and stronger glasses will be from time to time required.

Heterophoria, or weakness of some one or more of the ocular muscles, is very often a complication of some error of refraction. In this condition there is a continual strain upon the weaker muscle in order to do its work, and this alone will cause very many headaches, neuralgias, and general nervous symptoms. We have already considered this subject in cases where the irregular action of the muscles of the eyeball is sufficiently marked to produce squint, but ofttimes there is merely a loss of function, which can be determined only by careful examination. This condition, which is termed muscular insufficiency, is overcome by correcting the refractive error, and combining the glasses thus required with properly selected and applied prisms.

Let us now look at some common troubles not generally known to be due to ocular defects. Not a small number of reflex neuroses are caused by these defects. Headaches which come on after sewing, reading, watching a play, or otherwise using the visual organs in a special direction for a period of time, are usually the direct results of these defects. Neuralgia, dizziness, mental depression, melancholia, chorea (St. Vitus' dance), and even epilepsy, have been shown to be directly dependent, in certain cases, upon refractive errors for their causation. Out of nine cases of epilepsy in which there were optical defects, recently experimented upon, four cases were positively cured by correction of the defects; two of the cases were entirely relieved for periods of four and six months respectively; in another case the fits were greatly reduced in number during a given period of time, after the application of proper spectacles; while two cases were not influenced by glasses. Recurring styes are not infrequently due to some optical defect, and when thus occasioned they are to be cured, not by pulling out the lashes, but by having the defect corrected.

That by improving his defective vision one is enabled to pursue life's duties to better advantage, and with increased convenience to himself, need not be insisted upon. Some people go through much or all of life content—through ignorance or prejudice—without seeing but half of their surroundings, and often enduring the ills which we have seen to result from remediable ocular defects. To some people glasses are a revelation—revealing powers and beauties of vision never before known to exist.

How do you Advertise?

SOMETIMES an advertiser complains that he never got any good out of his advertisement. Every editor or advertising canvasser hears this now and again. The disappointed grumbler always blames the paper. But did it ever occur to you, gentle sir, that it was the fault of your advertisement and not of the paper? How did you word it? "John Generality, Dealer in General Merchandise, Philadelphia, Pa." Now, what is there in that to particularly strike a reader? He sees thousands of such advertisements every day he walks the streets. He already buys of many such people, to whom he is bound by ties of tradition and friendship. Why should he buy of you? You are a stranger and untried. You neither excite his curiosity, appeal to his good judgment, nor tickle his pocket book. No wonder silence is your only return. Let us make a suggestion before you prepare your next change of copy or enter the paper. We do this in our own interest as well as yours. We both want your advertisement and want you to get good returns from it. You undoubtedly will if you go about it right. What have you to sell? Everything? Don't advertise it. Run over your stock. Select one article. Is it better than your neighbour's, cheaper than your neighbour's; something they are out of, or that is seasonable and in large demand? Determine which feature is best calculated to accomplish your end. Then word your announcement briefly and attractively, and send it to us. If you have patience and keep at it, we will guarantee that you hear from it. An advertisement so worded and set will be read by every reader of the paper, and if there is anything in it worth considering, will lead to inquiry and sales.—*Grocery World.*

Pictures in Watches.

"I WANT you to make as pretty a picture as you can. Bring out the soft expression of the eyes, and be very careful about the mouth."

A young Wall Street broker was giving these directions to a jeweller down town, recently, and as he did so he laid his gold watch on the glass showcase. The jeweller assured the young man that he would have a perfect likeness of the young lady made, and laid the watch away in the drawer. Turning to a reporter, who was standing by, he said:

"Photographs in watches are becoming very popular. The gentleman who just left his order here wants the portrait of his intended wife placed in his timekeeper. The face of the young lady will be photographed directly on the inner case of the watch. During the past month we have taken more than 500 photographs, and some very prominent persons are among them."

"What does it cost to put a picture in a watch?" was asked.

"About $15. All the work is done by a French photographer, who makes a speciality of the work, and once a pretty face is placed in a watch by this method it remains as long as the watch lasts. And another thing, the chances are that no matter how hard up the owner of the watch gets he will not part with that watch."—*Keystone.*

Applications for Letters Patent.

The following List of Patents is compiled expressly for *The Watchmaker, Jeweller, and Silversmith*, by Messrs. W. P. Thompson & Boult, Patent Agents, of 323, High Holborn, London, W.C.; Newcastle Chambers, Angel Row, Nottingham; 6, Lord Street, Liverpool; and 6, Bank Street, Manchester.

12,906. G. Johnstone, Sheffield, for "The protection of pin and needle points and brooch pins." Dated August 18, 1890.

13,030. F. Thilo, London, for "An elastic guard or chain for watches." Dated August 19, 1890.

13,102. A. Boots, Eastbourne, for "Improved watch for the blind." Dated August 20, 1890.

13,151. W. H. Bishop, London, for "An improved combined pen and pencil holder clip, with or without watch attachments" (complete specification). Dated August 21, 1890.

13,180. A. Troescher, London, for "Improvements in Albert watch chains." Dated August 21, 1890.

13,196. C. E. Harby and D. Vaughan, near Hull, for "Improvements in the construction of sleeve-links." Dated August 22, 1890.

13,259. C. T. J. Vautin, London, for "Improvements in the apparatus for the extraction of gold" (complete specification). Dated August 22, 1890.

13,434. S. J. Davies, London, for "The Davies' improved electric clock." Dated August 26, 1890.

13,469. R. Westray, Carlisle, for "Improvements in sleeve-links." Dated August 27, 1890.

13,493. H. H. Lake, a communication from Société Industrielle de Moutier Grandval, Switzerland, for "Improvements in keyless watches." Dated August 27, 1890.

13,626. C. Bachen, London, for "Improvements in bracelets." Dated August 29, 1890.

13,728. B. Dukes, a communication from J. Heller, Germany, for "Improvements in bracelets." Dated September 1, 1890.

14,155. H. England, London, for "Improvements in electrical alarm clocks and watches." Dated September 9, 1890.

14,438. J. Ashwin, Birmingham, for "Improvements in watch-keys." Dated September 13, 1890.

14,468. G. Cornioley, a communication from C. Wilkinson, Canada, for "An improved watch-maker's tool." Dated September 13, 1890.

14,477. M. A. Sipman, London, for "A signalling device for clocks" (complete specification). Dated September 13, 1890.

14,480. A. P. King, London, for "An improved key protector." Dated September 13, 1890.

14,651. H. Haes, London, for "Improvements in or relating to watch stands." Dated September 17, 1890.

14,821. J. Tough, London, for "Improvements in spring clips or holders for suspending or retaining watches, jewellery, and other articles for exhibition and other purposes." Dated September 19, 1890.

The Deeds of Arrangement Act, 1887.

CHESTER.

McNair, John, 8, Pillory Street, Nantwich, watchmaker and jeweller. Trustee, John P. Whittingham, Willaston, clerk. Unsecured Liabilities, £305 11s. 7d. Estimated Net Assets, £196 14s. 9d. Deed of Composition dated September 6, 1890: filed September 12, 1890.

Creditors.		£	s.	d.
Little, James, and Co.	London	10	0	0
Evans and Brown	Birmingham	152	0	0
Hallis, H., and Co.	"	12	0	0
Hines, Richard	"	15	0	0
Leigh and Co.	"	12	0	0
Parker, John (Exors. of)	Nantwich	12	0	0

YORKS.

Green, George Lyon, Market Place, Beverley, watchmaker and jeweller. Trustee, Benjamin Pickering, Parliament Street, Hull, C.A. Unsecured Liabilities, £484 18s. 7d. Estimated Net Assets, £450. Creditors fully secured, £300. Deed of Composition dated September 3, 1890; filed September 9, 1890.

Creditors.		£	s.	d.
Cohen, Cohen, Lawrence, and Co.	London	40	0	0
Rolez, J.	"	17	0	0
Andrew, William	Birmingham	31	0	0
Evans and Brown	"	125	0	0
Eames and Co.	"	15	0	0
Watts, G. and F. E.	"	17	0	0
Marlow, J. C. H.	Coventry	15	0	0
Elkington and Co.	Manchester	86	0	0
Atkin Bros.	Sheffield	18	0	0
Parkin and Marshall	"	57	0	0
Shaw and Fisher	"	22	0	0

Rogers, Robert, 2, Jane Street, Hull, pawnbroker. Trustee, Frederick H. Allen, 5, Bavlalley Lane, Hull, accountant. Unsecured Liabilities, £248 1s. 8d.; Estimated Net Assets, £135. Deed of Composition dated September 10, 1890; filed September 13, 1890.

Creditors.		£	s.	d.
Jackson, Edw.	Hull	102	3	10
Barraclough, Wm.	Barton-on-Humber	131	6	9

SUSSEX.

Henson, Gilbert, 14½, East Street, Brighton, fancy jeweller. Trustees, Alfred Johnson, Downside, Epsom, gentleman, and others. Unsecured Liabilities, £2,063 14s. 7d. Estimated Net Assets, £1,815. Deed of Composition dated September 5, 1890; filed September 12, 1890.

Creditors.		£	s.	d.
King and Sons	London	73	0	0
Ettlinger, A. and J.	"	17	0	0
Walter, W. H.	"	16	0	0
Wich, Fred, and Co.	"	13	0	0
Levy, J.	"	10	0	0
Henson, Thomas M.	"	78	0	0
Pudney, W.	"	55	0	0
Henson, Sophia	Brighton	342	0	0
Batser, George	"	201	0	0
Johnson, A.	Epsom	61	0	0
Henson, G. C.	Lucerne	40	0	0
Privett, A.	Petersfield	58	0	0
Henson, Fanny	"	55	0	0
Baker, John	"	169	0	0
Traub and Co.	Vienna	12	0	0
Fox, A.	Windsor	826	0	0

LEICESTER.

Large, Thomas, 36, Market Place, and Pioneer Villa, North Street, Melton Mowbray, watchmaker and jeweller. Trustees, George Fitton, Burton Street, Melton Mowbray, grocer, and another. Unsecured Liabilities, £411 0s. 3d Estimated Net Assets, £519 7s. 1d. Creditors fully secured, £188. Deed of Composition dated September 2, 1890; filed September 5, 1890.

Creditors.		£	s.	d.
Milleret, P., and Co.	London	30	0	0
Perrins, W. C.	Birmingham	54	0	0
Large, Miss E.	Derby	10	0	0
Adcock, W.	Melton Mowbray	107	0	0
Stamford, Spalding, and Boston Banking Co., Limited	"	216	0	0
Fitton, G.	"	14	0	0
Moore, T.	"	12	0	0
Sapcoat, —	"	17	0	0
Powell and McCraith	"	22	0	0
Barron, S.	Peterborough	12	0	0
Harrison, W. W., and Co.	Sheffield	35	0	0
Large, Miss C. T.	West Grimsby	10	0	0

STAFFS AND WARWICK.

King Brothers, 16, Frederick Street, Birmingham (partners, Harry Francis King, 49, Archibald Road, Handsworth, and Rudolph King, 71, Finch Road, Handsworth, lately trading as), jewellers' factors. Trustee, E. M. Sharp, Birmingham, C.A. Unsecured Liabilities, £546 5s. 2d.; Estimated Net Assets, £213 14s. 6d.; Creditors fully secured, £1. Deed of Composition dated August 28, 1890; filed September 4, 1890.

Creditors.		£	s.	d.
Bushell, C.	Birmingham	18	14	6
Empson, F. F.	"	12	6	7
King, H. T.	"	33	19	5
Levi, S. M.	"	35	5	9
Minton, W.	"	36	14	9
Reynolds, Westwood	"	15	7	7
Stainton Bros.	"	17	19	11
Tandy and Rudge	"	41	8	5
Walton, G. E., and Co.	"	23	4	10
Wall, T.	"	20	0	0
Birmingham District and Counties' Bank	"	221	3	4

DEVON.

Antill, Sarah, 69, Union Street, Stonehouse, near Plymouth, watchmaker and jeweller. Trustees, George G. Poppleton, 26, Corporation Street, Birmingham, C.A., and others. Unsecured Liabilities, £1,658 7s. 6d.; Estimated Net Assets, £600. Deed of Composition dated August 27, 1890; filed September 2, 1890.

Creditors.		£	s.	d.
Brockington Bros.	Birmingham	232	0	0
Sloane and Carter	"	154	0	0
Allday, John, and Son	"	153	0	0
Harris, Henry, and Co.	"	27	0	0
Brooke, Brooke, and Co.	"	90	0	0
Soloman, Lyons	"	152	0	0
Pearce, Henry	"	29	0	0
Langley and Co.	"	21	0	0
Wilkinson, W. D.	"	385	0	0
Bichofschwerder, David	Penzance	153	0	0
Smith, I. F.	Plymouth	54	0	0
Hodge and Co.	"	50	0	0
Tucker, Henry	"	35	0	0
Northey, E. A.	"	28	0	0
Devon and Cornwall Bank, Limited	Stonehouse	60	0	0

Allen, Richard, 18, Montpelier Road, and 87, Mansfield Place, Kentish Town, London, bronze powder manufacturer.

Creditors.		£	s.	d.
Bessemer, Sir Henry	London	50	0	0
Eiermann and Tahor	"	25	0	0
Macpherson and Co., Limited	"	59	9	0
Pickerdite and Co.	"	27	9	10
Saler and Wank	"	17	11	6
Wilkinson, Heywood, and Co.	"	69	2	4
Clifford and Son, Limited	Birmingham	42	0	0
Allen, W. S.	Sheffield	530	0	0

Total Estimated Amount—£860 11s. 4d.

Preferential Creditors.		£	s.	d.
Bessemer, Mrs.	Bromley	47	10	0
Rates, etc.		32	13	1

Total Estimated Amount—£80 3s. 1d.

Weinrabe, S. (Abraham Maurice Weinrabe), 14, Burdett Road, Bow, London, wholesale jeweller.

Creditors.		£	s.	d.
Buper and Sons	London	55	0	0
Buck, C.	"	40	0	0
Hunt, E., and Son	"	23	0	0
Iveson, A. J.	"	26	19	0
Notton, S., and Co.	"	115	15	0
Prag, J.	"	29	17	0
Suskind Bros.	"	30	7	6
Simon Bros.	"	85	13	6
Warne and Co.	"	43	7	6
Griffiths, H., and Co.	Birmingham	27	10	0
Nicholls and Trevitt	"	65	0	0
Saunders Bros. and Greaves	"	23	2	0
Walton, G., and Co.	"	81	6	4
Rose, —	Fakenham	30	0	0
Bretigne, A., and Co.	Locle	15	2	6
Grenier, E.	Morez-ai-Jura	33	4	0
Feldmeirer and Bock	Offenbach	103	0	0

Charles, Frederick Harry, 19, Church Street, Soho, London, manufacturing jeweller.

Creditors.		£	s.	d.
Ayres, R.	London	138	18	0
Carter, John	"	15	8	0
Calipe, Dettmar, and Co.	"	17	0	0
Clarke, Dr.	"	23	0	0
Cooper and Son	"	10	19	4
Elgy, W. T. R.	"	14	4	9
Gothard, Charles, and Co.	"	10	0	0
Hamburger, E. M.	"	55	3	9
Hahn and Co.	"	23	0	0
Hugenin, Hall, and Co.	"	10	0	0
Koningh, H. de	"	17	2	0
Landsherg and Sons	"	115	0	0
Lewis and Saloline	"	60	0	0
Landeck, S. B.	"	13	18	6
Mayer, Max	"	260	0	0
Nockold, F.	"	40	0	0
Rawlings, T. H.	"	16	12	0
Schmidt, —	"	200	0	0
Stribling, C.	"	21	0	0
Welby, D. and J.	"	30	2	6
Weiner, Samuel	"	77	10	0
Wilson, O.	"	13	17	10
Wilkinson, Curryer, and Co.	"	10	0	0
Bragg, T. and J.	Birmingham	44	6	9
Smith, S. W., and Co.	"	43	0	0

Total Estimated Amount—£1,313 4s. 3d.

Liabilities on Sheet "D."		£	s.	d.
Charles, Ann	London	300	0	0
Charles, Bernard	"	500	0	0
Charles, Gertrude	"	250	0	0
Charles, William	"	250	0	0
Charles, Bernard Charles, Gertrude Charles, William	"	400	0	0

Total Estimated Amount—£1,800.
(Of which £400 is expected to rank).

		£	s.	d.
Preferential Creditors		50	0	0

Owen, Lewis Thomas, 4, North Court, North Street, Leeds, manufacturing silversmith and nickel plater.

Creditors.		£	s.	d.
Hartley, J. E.	Birmingham	18	5	10
Parthington and Co.	Bradford	28	10	0
Peckover, S.	Leeds	30	0	0
Ellison, J.	"	13	8	2
Stead, —	"	35	0	0
Townend, J. F.	"	18	0	0
Leeds Corporation	"	10	8	6
Maxfield, —	Sheffield	11	8	1
Sundry Creditors under £10		22	15	7

Total Estimated Amount—£187 15s. 7d.

		£	s.	d.
Preferential Creditors		20	5	0

Pickworth, James, 18, Hargrave Park Road, Junction Road, Highgate, late Camden Street, Camden Town, London, jeweller.

Creditors.		£	s.	d.
Edwards, William	London	10	0	0
Griffiths, H. J.	"	26	4	0

BANKRUPTCY PROCEEDINGS.

List of Creditors.

Charles, Frederick Harry, 19, Church Street, Soho, manufacturing jeweller. First meeting: 33, Carey Street, W.C., Sept. 17 at 1. Examination: 34, Lincoln's Inn Fields, October 15 at 11.

Jacobs, Montague Emanuel, 9, Albert Street, Blaenavon, late Queen Street, Cardiff, formerly Commercial Street, Newport, clothier and fancy dealer, and at present pawnbroker's salesman, but otherwise out of business. First meeting: Official Receiver's, Merthyr Tydvil, September 3 at 12. Examination: C.C., Tredegar, October 3 at 10½.

Jordan, John, 3, Alfred Street, Warstone Lane, Birmingham, manufacturing jeweller. First meeting: 25, Colmore Row, Birmingham, September 2 at 11. Examination: C.C., Birmingham, September 30 at 2.

Kirner, Raphael, trading as Winterhalder and Co., 99, Bishopsgate Street Without, watchmaker and jeweller. Receiving Order: September 2.

Kirner, Raphael, trading as Winterhalder and Co., 99, Bishopsgate Street Without, watchmaker and jeweller. Adjudication: September 9.

Medlen, Montagu, late 246, Kentish Town Road, London, now 144, Herbert Road, Plumstead, jeweller. Receiving Order: September 3.

Mitschke, Harold, 76, Free Trade Hall, Lynn Street, and 13, South Scarborough Street, West Hartlepool, watchmaker and jeweller. First meeting: Royal Hotel, West Hartlepool, September 3, at 4¾. Examination: Court House, Sunderland, October 23 at 2½.

Owen, Lewis Thomas, 4, North Court, North Street, Leeds, and 23, Dorris Grove, Stoney Rock Road, Burmantofts, late 42, Leighton Lane, Leeds, electro-plate worker. Receiving Order and Adjudication: August 21.

Owen, Lewis Thomas, formerly 42, Leighton Lane, now 23, Dorris Grove, Stoney Rock Road, Burmantofts, and 4, North Court, North Street, all Leeds, manufacturing silversmith and electro-plater. First meeting: Official Receiver's, Leeds, September 10, at 11. Examination: C.C., Leeds, September 23 at 11.

Paul, Charles, trading as M. Armstrong and Co., Bewsey Chambers, Warrington, and now or late residing at 15, Grosvenor Terrace, Latchford, jeweller. Receiving Order: July 31. (Amended notice.)

Paul, Charles, trading as M. Armstrong and Co., Bewsey Chambers, Warrington, and now or late residing at 15, Grosvenor Terrace, Latchford, jeweller. Adjudication: August 13. (Amended notice.)

Paul, Charles, trading as M. Armstrong and Co., Bewsey Chambers, Warrington, now or late 15, Grosvenor Terrace, Latchford, jeweller. First meeting: Court House, Warrington, October 3 at 11½. Examination: same place and date at 11¼.

Stewart, James, 124, Wardour Street, Oxford Street, and 44, Richmond Gardens, Lillie Road, Kensington, carver and gilder. Receiving Order and Adjudication: September 4.

Wadsworth, John, Turner's Hill, Cheshunt, watch and clock maker, jeweller, and fire insurance agent. Receiving Order: September 4.

Wadsworth, John, Turner's Hill, Cheshunt, watch and clock maker, jeweller, and fire insurance agent. Adjudication: September 10.

DISSOLUTIONS OF PARTNERSHIP.

Feldenheimer and Co., 21, Holborn Viaduct, diamond merchants. September 1. Debts by Ferdinand Feldenheimer and Otto Herz, who continue.

Freeman, J. and T. H., 59, Northampton Street, Birmingham, jewellers. September 6. Debts by Joseph Freeman.

Ogley, Fras., and Co., 81 and 83, Effinham Street, and 12, Norfolk Street, Rotherham, pawnbrokers and salesmen. July 23. Debts by Thomas Hardy.

CORRESPONDENCE

All Letters for Publication to be addressed to the Editor *of* The Watchmaker, Jeweller, and Silversmith, *68, Fleet Street, E.C.*

All communications must bear the name and address of the sender, not necessarily for publication, but as a guarantee of good faith.

To the Editor of *The Watchmaker, Jeweller, and Silversmith.*

THE LONDON WATCHMAKERS' TRADE ASSOCIATION.

Dear Sir,—I am directed by the committee of above association to tender their best thanks for your able article on the recent prosecution under the Merchandise Marks' Act in the September issue of your admirable periodical. The association have every reason to believe that the Act has operated as a deterrent in many cases, but we are constantly receiving information that the frauds still continue, and in order that The London Watchmakers' Trade Association (the only one as yet to take any action) may continue its work of protecting the long-suffering workers of a highly-skilled craft, and the general public from being robbed, we venture to appeal through your paper to all branches and sections of the trade to come forward, join our association, and aid us in our efforts to induce honest trading. We are sorely in need of financial assistance, the prosecutions being costly; and our best thanks, together with official receipt, will be returned to anyone good enough to remit cheque or postal order to the office, crossed to account of the association, "Finsbury Savings Bank."

I have the honour to be, Dear Sir,
Your obedient Servant,
FRED. RICHARDS.

29, Northampton Square, London, E.C.
September 16, 1890.

The Watchmaker, Jeweller and Silversmith.

EDITED BY D. GLASGOW, JUN.

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NOTICES.

Correspondence.—Correspondence is invited on all matters of interest to the trade. Correspondents will please give their full address in each communication, not necessarily for publication, but as a guarantee of good faith.

Subscription.—A copy of the Journal will be sent monthly for one year, post free, to any address in the United Kingdom or countries in the Postal Union for 5s., payable in advance.

Advertisements.—The rates for advertising will be sent on application. THE WATCHMAKER, JEWELLER AND SILVERSMITH will be found an exceptional medium for advertising. Special Notices, Situations, etc., per insertion, 1s. for two lines, prepaid.

All communications to be addressed to the Publishers,

HEYWOOD AND COMPANY, LIMITED,
68, FLEET STREET, LONDON, E.C.

Agents for the Australian Colonies:—
BOSCH, BARTHEL AND CO.,
409, GEORGE STREET, SYDNEY.

Notes About Town.

Preparations for the Season. NOTHING of very great importance to the trade occurred during the past month, although there were not wanting signs of preparation in various quarters for the coming winter season. Perchance all of those persons doing a steady jog-trot round of business right through the twelve months will not recognise that there are seasons in their routine. That there are such, nevertheless, is well known to the better informed of our manufacturers, who do well to prepare for them, and anticipate their requirements. Perhaps the necessity for manufacturers and retailers (more especially the former) keeping themselves up to date in such requirements of fashion, and intelligently forestalling them, is never more apparent than at the present time of the year, for, notwithstanding the greatest amount of care and discretion in selecting and manufacturing designs and goods for stock that may be used, buyers very frequently run the makers into a corner by deferring their orders till the last moment, and then rushing on to one particular article like a flock of sheep.

High-class Christmas Novelties. THE various designs in moonstones, *cabochon* and cameo, both unpolished and polished, are likely to retain their popularity this year; indeed, judging from the large amount of these beautiful stones that have been sold during the year, it must even be on the increase. But the possibilities of the happy combinations of the moonstone are hardly as yet entered into. Hitherto it has chiefly been associated with diamonds, with here and there pearls, and only just now and then a ruby; but it also produces most refined effects with violet sapphires, amethysts, spinels, and tourmalines, while contrast effects are obtained best of all by flat enamels, a fact hardly thought of as yet.

* * *

Pretty French Ideas. A FORMIDABLE rival in the field is, psrhaps, the *"pierre orientale"* of the French. The designs consist firstly of flowers, the petals of which are cut from chalcedony, either naturally or artifically coloured, and the leaves diamond work, or a diamond placed at the re-entering angles of the lobes of the leaves, or on the leaf as a dewdrop. With a stone like chalcedony, that lends itself to such extensive colouring, the imagination and conception of design is practically unlimited, and the natural colours of many flowers may be produced with admirable effect, and we only hope that this may lead to the higher cultivation of the glyptic art, and this also in England, as it is very humiliating to see these children of foreign parents posing as the heirs of fame among our own. The most lovely orchids could be produced by this process, and coloured after carving with a colouring as permanent as enamels. The delicacy of the lily, or the brightness of the peony, could be matched with equal effect, as well as the paste colourings of composite flowers. The second style is that of grapes, etc., exactly like the natural fruit of the smaller varieties, say half an inch in diameter. Two of these joined by a small sprig or stalk of diamonds, with the introduction of a graceful vine leaf, sometimes in diamonds and sometimes in chalcedony, are made up into hair-pains, or dangle in twos from wire bangles, or three are set as a long brooch with one grape as earrings. These are both green and dark plum. They have been bought up readily. The beautiful bloom on the grape is effectively imitated by varying the coarseness of material employed in cutting.

* * *

Mining and Metallurgy.

It is very rarely an exhibition is brought together, so great a part of which so directly concerns the interests of our readers as the International Exhibition of Mining and Metallurgy at the Crystal Palace must have done. When we saw the prodigious trophies, such as those of the Witwatersrand Mining Company, representing 26¼ tons of gold from one locality, or the colossal monument representing silver raised by the Broken Hill Proprietary Company, Barrier Range, N.S.W., to the extent of over 71,000 tons—and these only two instances, others being able to quote their bullion by the thousands of tons—and realise how great a proportion of this is absorbed and employed by our crafts, one can form some idea of the importance and dignity of our position in the world's commerce. Not a bit the less interesting must have been the statistics supplied by the various exhibitors, not by company puffers, but under the hand of Government authority. They contain a great deal of information that must be invaluable to those seeking to extend their businesses to the colonies. A few years ago, when Mr. Daniel Frantes left his good position in the South African diamond mines to go towards the centre of Africa to find gold, the whole of the diamond miners, and old gold miners too, ridiculed him now the South African mines are pronounced by skilful mining engineers well known to us to be unexampled in any known gold fields of the world.

* * *

Possible New Diamond Fields.

The exhibition of the diamonds of New South Wales, although not gigantic, was both important and interesting; those who have watched the publication of Professor Leversidge's Government reports must have been delighted with their substantial supplementing. Up to the present time in only four districts there have been found 50,000 diamonds, and these only from the gravels where they occur as associated pebbles, along with rubies, sapphires, tourmalines, lorcons, topazes, etc., and a number of more or less peculiar minerals; and when we remember the direction of these rivers, from and through the highlands, it requires no stretch of the prophetic imagination to predict that just as the Vaal was suspected to cut through a diamond-bearing rock long before such a rock was discovered, but that it ultimately was discovered—so in Australia, some day when we little expect it, the Australian squatter may find in his hut-wall the corresponding prize to Van Nierik. But we need not wait for the discovery of the diamond-pipes; diamonds already occur in quantities that would rejoice the heart of many a South African diamond-washer in either of the mines. Thus in exhibit 191 there were shown specimens of the diamond drift; forty loads of which yielded upon washing 1,500 diamonds, weighing 500 carats; and from specimens of it which we have washed ourselves we should think this a fair average.

* * *

A Few Minerals with a Future.

The display included minerals whose variety now precludes their employment, but whose use and value in the hardening and tempering of steel point to their becoming cheaper, and thus into more general use. The opals, too, must have delighted the eyes of everyone, some of them being possibly among the finest ever found, and presenting features never seen before in this country by any trader or mineralogist with whom we are acquainted. The ornamental stones of the Swedish Court were of exceptional interest, and we can picture the gorgeous clock cases some of them would make; both the rose pink Thulite, which is far harder than alabaster, and susceptible of a beautiful polish; and the remarkable granitic rocks, with crystals of orthoclase of all colours and sheens, from the soft glimmer of the moonstone to the full blaze as in labradorite. This material is only just introduced into the market, but has a glorious future before it.

* * *

Rogues and Thieves.

One is often at a loss to account for the remarkable fact that otherwise good shrewd business men should be content to part with property, with hundreds of pounds worth of their stock, for a piece of paper filled in and stamped by someone they never saw before, and often (alas!) never see again! Yet we know there are many such, and who flatter themselves they are the possessors of some occult power—not enjoyed by ordinary mortals—of "being able to tell a gentleman as soon as they see him," and will assure you by all that is good that they never fell a victim to its misguidance. We suppose there are many who, while they do not go so far as this, are nevertheless content to accept cheques as payment for goods without using one grain of that indispensable commodity we call common sense. During the early part of October several London houses received visits from a gentleman who drove up to the door in a brougham, with a servant in dark green livery, presenting his card, "Dr. Isherwood, Ionic House, Woodgrange, Forest Gate"; stating that he was about to be married, and that he required wedding presents, and also some things for himself. In one instance he selected goods to the value of £575 with all the attendant plausibility of a genuine customer, carefully keeping down the price of certain things, and even pressing for a reduction; and sometimes choosing things which would have to be sent home subsequently. At the conclusion of the business he presented a cheque, and was quite surprised that it would not be accepted, as it was the first time in his life his cheques had been refused; if he had only been certain of the amount he should require he could have brought notes with him from the bank. Finding the goods would not be parted with, he very mildly observed that it didn't matter, he would go and see his afternoon patients, and call in later on in the day with the notes and the lady, who could see the goods before they were paid for. But, needless to say, he did not go to Forest Gate Bank, but to the West-end, probably in hopes of better success. In several places he was unsuccessful, but not, we are sorry to learn, in all. His description was given to the police, and two days after he was tracked to Paris. Owing to the expensive and troublesome machinery of the law in that country, no one would trouble to prosecute him. As he is, however, a returned convict, he may visit us again a little later, and perhaps may honour one of our larger towns with a call. If so, he is 5 ft. 7 in. in height, dark chestnut hair, rather sallow complexion, largish orbits, fullish eyes, longish nose, rather bony features, small moustache, and no beard.

* * *

Duplicity and Innocence.

A MORE successful rogue was the one brought up at Marlborough Street, known under the names of Graham, Levock, and Stone. Having introduced himself to a solicitor of New Square, he made such representations to this oracle of the law that the latter really believed him to be a genuine fellow, and gave him a card of introduction to a West-end tailor, who in turn introduced him to a firm of West-end jewellers, whose experience with cheques by this time ought to have sharpened their wits. However, they allowed him to obtain possession of £1,136 worth of jewellery, and for nine months since he has successfully eluded capture. Recently he was found to be at the old game, and his whereabouts having become known, he was given into custody on the 24th ult., as he was leaving another jeweller's shop, whom he was favouring with a visit.

* * *

A Rascally Triad.

OCTOBER also saw the capture of a set of three of the cleverest thieves that ever organised a set of robberies upon the trade. They consist of a man said to be fifty, but looking considerably older, and one fair young lady, and one rather dark, under thirty, dressed in the most fashionable manner. The husband of one of these, we believe, is being maintained at Government expense in a County Gaol. For the last two months it has been circulated through the M** that such a triad were waiting upon the trade, and its members warned, but nevertheless they successfully carried on their shoplifting in over a dozen cases, amounting to probably something over £2,000. By one single indiscretion on the part of the male prisoner they were traced out. In one instance he sold a sapphire, the proceeds of one of the robberies, for £38, the money for which was paid in a cheque. Upon getting it cashed he gave two pounds and received two £20 notes; these he paid into a deposit account he was accumulating at an American agency, and to this agency the Bank of England was able to trace the notes, and thus to discover through the agent the prisoner. The *modus operandi* of these three thieves was essentially the same in all cases. They went in, asked to see a number of things, and sometimes selected something, and left a deposit upon it, or even spent £10 or £15, and waited an opportunity for taking away what they could secure. The style in which they were dressed, and their being Americans, who transact business somewhat differently from the ordinary English customer, placed them beyond suspicion; but the moral is: "Remember, we don't know a stranger."

* * *

What Would Be Better.

MESSRS. G. M. EDWARDS and W. J. Griffith, both of London, have taken out a patent for an apparatus for the purpose of separating precious stones from the earthy matter in which they are found by means of a certain combination of mechanism described in the specification of their patent. The idea may be good or it may not—a more useful one would be to direct the searcher to the finding of the stones; they would soon be extracted by the ordinary processes. But these are go-ahead days.

* * *

Pulling Together.

THE Coventry Association for the Protection of Trade Interests have shown their appreciation of the efforts of the kindred London association by a donation to the funds of that body, and an appeal to the trade generally to assist the central body. This looks like pulling together in the right direction, and we should like to see the other associated bodies show the same solicitude for the good of the trade.

NOV

* * *

For the Good of the Trade.

TALKING of this kind of thing, there have been several cases of fraud in the Birmingham jewellery trade, which a good many people think should have been taken up by the Association of that city. However, writing to the local press in answer to letters charging the Association with partiality, the chairman, Mr. J. M. Banks (while refuting such charges) seems to think that, for the present at all events, the province of the Association lies in another direction. Perhaps from the educational point of view he is right, but the time does not appear to be far distant when prosecutions for all such offences shall emanate from the manufacturing trades themselves, and thus, in protecting the public and the retailer from being swindled, protect their own good name and reputation.

* * *

Prescot's new Industry.

THE discovery of a new industry for a small town like Prescot is an event of sufficient importance to fully justify the joyful anticipations of both the townspeople and the local press; and it is not to be wondered at that they both rejoice at the establishment of such a factory as that of the Insulated Wire Company. It never rains but it pours (the workpeople of Prescot were for a long time in a very unenviable position as regards employ and pay), and the establishment of the new company, following close upon that of the watch factory, may well prove a turning-point in the prosperity of the town and neighbourhood.

MRS. BARGAN: "What are you worryin' about this morning?" Mr. Bargan: "I need some new clothes and a watch, and I can't make up my mind whether to get the clothes at a shop where they give away watches, or to buy the watch at a shop where they give away clothes."

Midland Jottings.

By MERCIAN.

There has been plenty of material for conversation in the jewellers' quarters this month, but, more's the pity, material of a very unsatisfactory nature. Last month I had occasion to refer to the feeling of insecurity which was felt in trade circles in Birmingham by reason of certain rumours which were rife of pending actions, to which publicity was given in the local press. The "moral atmosphere" has not clarified at all since last I made my jottings; in fact, it has become more dense and lowering. Nothing further has been heard of Mr. J. C. Stokes, who was arrested, but two matters of deep import, both affecting the morals of the jewellery trade, have arisen and remain suspended like a cloud.

Messrs. S. Blanckensee and Sons, Limited, of Frederick Street, have, through their secretary, Mr. Walter Davies, taken out summonses against Messrs. Evans, of Northampton Street, under the Merchandise Marks Act. The charge is that of applying a false trade description to some bracelets, and selling them so described on August 16th and September the 3rd and 8th. In addition to Messrs. Blanckensee's action, the Assay authorities are also said to be demanding the usual penalty on each article sold as nine carat, but really of inferior quality, which is £10 on each one. So far the Jewellers' Association have decided to take no active part in the matter, although letters have appeared in the papers calling on them to do so. The chairman of the association—Mr. J. M. Banks—however, replied in another letter stating that the association were quite prepared to do their duty when the occasion arose, but as the case was *sub judice*, it would be palpably unfair to discuss it.

Now, though Mr. Banks is quite right in saying this case should not be discussed, still there are reasons why the principle of the thing should be discussed, and that with as much publicity as possible, for it casts a reflection on the trade, which ought to be removed without delay. Everyone knows that the gold from which the various pieces of jewellery are made is sent in strips to the Assay Office, to be tested and marked, and then returned to the manufacturers to be made up. The summonses against Messrs. Evans declare that silver solder has been added in considerable quantities to this returned strip gold in the shaping, and that instead of being nine carat, as marked at the office, it is reduced to six-and-a-half carat. The question arises over three consignments of bracelets, and it is alleged that these bracelets, which average four or five to the ounce, cannot be made for the price of forty-five shillings per ounce. The least price on which a profit could be made, it is declared, is forty-eight shillings. It is pointed out, however, that the price does not depend wholly on the quality of the metal, but also upon the workmanship, and one correspondent maintains that at forty-five shillings a profit on a nine carat bracelet *may* be realised.

At the time of writing the case has not come into Court, so that I am unable to give any definite statement on the matter. Messrs. Evans, of course, will have every opportunity of refuting this grave charge—a charge which not only affects them, but also the whole morality of the jewellery trade. In a case of this kind, if an indictment is found the offender may be fined and sent to prison, even with hard labour, for as long a period as two years; if on summary conviction, to a term of not more than four months, or a fine of £20, for a first offence; and six months, or £50, for a second, with or without hard labour. In addition, the falsely marked articles are confiscated. In addition to this the Assay authorities are empowered to demand £10 on each article found to be below the standard or described quality.

The gravity of the whole business may be seen from the heavy penalties which may be inflicted, but this is the least important thing, as it is the status of the trade which suffers. Commercial honesty is questioned, and the minds of retail customers disturbed, in that they will be made to feel that there may be an uncertainty regarding the quality of the articles they purchase, no matter how respectable and reputable the firm may be from whom they derive their purchases. No trade can afford to suffer in this way, and the jewellery trade of Birmingham is not capable of withstanding a charge of this kind with impunity. It therefore behoves, not only the Jewellers' Association and its individual members, but everyone else in any way connected with the trade, to do their utmost to clear up any and all doubts which may be felt on the subject.

Another matter which, however, affects the quarter alone and not the public is the proceedings in bankruptcy against Harry Davis Brenholz, jewellers' factor, of 29, Summer Hill Terrace, Birmingham. In this matter Mr. Allen Edwards was appointed trustee, and a committee of inspection, consisting of Messrs. H. Hyde, H. R. Wright, T. Hopwood, A. C. Jaques, and A. Appleby, was appointed. Mr. Tanner, the debtor's representative, offered a composition of seven shillings in the pound. Although several gentlemen were in favour of accepting this, the official receiver (Mr. L. J. Sharp) said that there was little chance of the Court accepting such a resolution. Eventually, after considering the number of proxies received from absent creditors and the facts of the case, it was decided in favour of bankruptcy. The opinions regarding the debtor expressed at the meeting seemed to prove that he was regarded in anything but a favourable light by the trade; and, indeed, the evidence as to his career and methods of trading was such as could only lead to the formation of an unfavourable opinion.

It appears that the debtor commenced his career in business in 1862, without capital, as a jeweller's factor at Liverpool; and three years after was declared a bankrupt, with liabilities of over fifteen hundred pounds, and assets something over nine hundred. The next year, in consequence of his having incurred debts of an unreasonable nature, his discharge was suspended for six months. Afterwards the debtor went into partnership with his father-in-law, and traded in Liverpool for three years, and then removed to Vyse Street, Birmingham. In 1878 his partner died, and in the following year he was again made bankrupt, with liabilities of nearly eight thousand pounds, and assets about two thousand five hundred. Afterwards a composition of five shillings in the pound was accepted, and the adjudication made void in November, 1879. Since this date he has carried on business variously at Belgrave Road, Claremont Road, Soho Hill, and at his present address, where he removed six years ago.

His liabilities in the present instance are £6,034, which were expected to be reduced to £5,012, and against this sum the assets are £2,098. The facts that have come out in reference to his methods of business are extremely interesting. It appears that in January he bought goods to the amount of £799 0s. 3d., and his sales were £393 18s. 9d.; in February he bought £188 15s. 10d. worth, and sold £259 7s. 11d.; in March he purchased goods to the value of £441 1s. 1d., and sold £352 2s. 2d.; in April the goods bought amounted to £2,260 8s. 5d., while his sales account shows £214 15s. 9d.! Soon after he called his creditors together, but he states that it was not till July 4th, when his credit was stopped at his bank, that he knew that he was insolvent. In explanation of the remarkable difference between his bought and sold accounts, the debtor said that he travelled, and was sometimes as much as eight weeks on a journey, and he bought goods to go away with him on his next journey. In conclusion, the Official Receiver said he must ask the debtor for a statement of his affairs for the twelve months preceding the date of the receiving order, a trade and cash account, an amended deficiency account, and details of the purchases in April.

One of the creditors who declared in favour of a composition (Mr. Jaques) said that he had heard rumours of a prosecution under the Fraudulent Debtors Act that had been threatened, but that the period (four months) prescribed by the Act had elapsed since the date of the transaction which had been considered questionable. The Receiver said this was an undoubted objection, but it did not therefore improve the conduct of the debtor. As far as I can see, this conduct was of the sort that every fair-minded commercial man must condemn, and advantages over what is really a not unuseful law, like these, taken by men not too much troubled with scruples of commercial morality, should be met with all the sternness possible. What is possible to be done should be done, and such trading put a stop to with an unflinching hand. Fortunately, the Official Receiver of Birmingham is not a man who is likely to be weak-minded in his judgment; his acute legal mind seizes upon the facts of any case with considerable ingenuity, and it is to be hoped that he will receive the support of creditors in any and every case which comes into his hands, so that they may be dealt with, not only from the point of view of what is best under the circumstances for the creditors, but what is best for the morals of trade.

I see that the Edinburgh Exhibition committee have adopted the extremely unsatisfactory custom which I believe prevailed at the Electrical Exhibition here last year as regards their medals. Exhibits of firms are awarded by the committee a silver medal for their excellence, and with the notification to the firm from the officials is also a notification of another fact, that if they want the medals they must pay for them. This is not only mean, it is wrong. Firms who exhibit surely go to enough trouble and expense without having also to pay for their award. But not only this. Do not these firms contribute to the success of these exhibitions? In fact, if every firm applied to refused to exhibit, where would the exhibition be? It is very clearly the duty of the committee to be at the expense of whatever medals are awarded.

A deputation from Birmingham representing the silver-plating trade went to Sheffield the other day, to confer with the Sheffield Federated Trades Council. Mr. S. Uttley the well-known plater of Sheffield, moved a resolution in favour of federated labour, which was seconded by Mr. Whittle, of the same trade, in Birmingham. He described the bad state of the Union of Electro-Platers in Birmingham a year ago, but stated that they had now completely resuscitated it, and raised the numbers from 114 to 300, and their capital had increased by £200. This is all very well, but the New Unionism, I am afraid, will receive a big check (not cheque) one of these days, and men will see that their independence has gone with their shillings into the coffers of their Union, where it has become everybody else's but their own. Personally, I feel the sooner they see this the better.

The Operative Jewellers' Society, as well as the Electro-Platers, seem to think that the trade is good enough to warrant a rise in their wages, and the step they have taken in the matter is to adopt the coercive principles of the New Unionism. At a meeting of working jewellers on the 9th of October, a resolution, moved by Mr. Chatwin and seconded by Mr. Gye, was unanimously carried in favour of the men at the meeting joining the association. I should have thought there had been troubles enough in the trade already, without resorting to measures of compulsion, not to say extortion, and so causing other worries. Why cannot the thing be settled in a fairly proposed and legitimate way, by man meeting master? Instead of this, however, we find the secretary of the society (Mr. Allen) moving, "That an increase of wages can only be secured by the men engaged in the trade combining together for united action." This is a proposition that will not hold water. It is untrue to state that this is the *only* way increased wages may be obtained. It is a sure way of creating further troubles.

An interesting piece of jewellery is the "In Memoriam" brooch and cross which has been registered by Messrs. Light and Witcomb, of 2, Augusta Street, Birmingham, of the late Cardinal Newman. The designs were submitted to the Fathers of the Oratory, and approved by them, and copies of the brooch and cross have been accepted by Father Neville, the Cardinal's early friend, and by Cardinal Manning. It is pronounced to be a work of art and a faithful likeness, and the die has been sunk with much care by one of the best firms in the trade. The memento is only supplied by the manufacturers to wholesale houses.

The watch trade in Coventry is now in a flourishing condition, for books are well supplied with orders, and hands are busily employed in overtime. The competition of foreign manufacturers is felt keenly, however, and Swiss watches of all qualities are bought and sold in large quantities in this country. This kind of competition has been very much reduced since the passing of the Merchandise Marks Act, to which is due largely the increase of orders for English watches. The want of more workmen is becoming a serious question in Coventry at the present time, for there are a number of orders which have long been on the books still unexecuted.

The Watch Trade Association of Coventry, at a recent meeting, voted a sum of £5 5s. to the funds of the London Association, which is carrying on prosecutions for infringement of the Merchandise Marks Act, which are of very great use to the trade as a whole. An appeal is to be made to the watch manufacturers of the town and of the country, to subscribe a sum which will enable the association to carry on important prosecutions against the frequent and serious infringements of the Act which are known to exist.

Sheffield Notes.

(From our Correspondent.)

Is the Anglo-Saxon race losing its sense of humour? Either that is so or that section of it impervious to a joke is coming gradually to the front. There is nothing incompatible with a common sense view of things in the idea of a Trade Union, and yet the salutary principle underlying it is being pushed to an absurdity. The latest development of the "New Unionism" is an attempt to form a Union among the girls employed at the Don Confectionery Works. This of course would be all right were it a spontaneous movement among the girls themselves. It is scarcely that, however. In point of fact, it is an attempt of the Gas Stokers' Union to induce the female employees of the Don Confectionery Works to join them. Now, the connection between Gas and Trades Unionism in the abstract is not so remote as to be inconceivable, but the affinity between these two particular occupations is less obvious. At any rate, it cannot be seen by the manager of the Don Confectionery Works, who, although not averse to a Union among his "hands," objects to a lot of gas men interfering in his business. The consequence is a lock-out, which is likely to be permanent, as the places of the foolish virgins are already filled up. The incidents of the "struggle," so far, have been sundry meetings at the Westbar Pump, where those most interested were conspicuous by their absence, and the conviction of a grinder for threatening a "blackleg" confectionery worker.

The labour question is responsible for a serious difficulty, in which Mr. H. J. Wilson, of the Sheffield Smelting Company, finds himself. It may or may not have been his experience as a gold and silver smelter which has suggested to Mr. Wilson the advisability of throwing the various parts of the United Kingdom into the melting-pot, but certainly he is understood to have advocated that course in the Commons House of Parliament on behalf of the electors of the Holmfirth Division. The said electors, however, being mostly coal miners, have recently resolved to support no candidate at the next general election who will not support what is known as the Eight Hours Bill. Mr. H. J. Wilson consequently finds himself cornered. I don't see why he should. To the non-political mind, Mr Wilson appears to have agreed to vote for so many things, that one more could scarcely make very much difference. Besides, Mr. Wilson has not said that he won't vote for the measure which he, as a large employer of labour, evidently does not like—he simply can't make up his mind. Now, this is not like the member for the Holmfirth Division, who, as a rule, makes up his mind very quickly indeed. In a case like this, the man who hesitates is lost—a consummation which would be a blessing in disguise to Mr. Wilson and no detriment to the House of Commons.

Mr. J. T. Cook's recent speech before the annual reunion of School of Art students continues to be discussed. Out of the discussion have arisen broader issues than were, I think, contemplated by Mr. Cook when he made his speech. The relative efficiency of the present School of Art system has been called in question by one writer to the local press, who points out that the men whose names still linger in the traditions of the school were not actually produced by it. This may be true of some names which he mentions, such as Godfrey Sykes, Young Mitchell, and Charles Green; but when he indicates what may by comparison be called the younger set, such as Hugh Stannus and Richard Lunn, I think he is wrong, as I have a distinct recollection of these now mature citizens going through the drudgery of the Laocoon from the flat and the egg plant from the round. There is unfortunately a good deal of time wasted in the grinding done by most kinds of educational machinery, but, on the whole, I think our School of Art—although it may be hampered to some extent by South Kensington red tape—does its work fairly well, and makes the most of the material on which it works.

The news of the death of Mr. Arnold T. Watson, Master of the Sheffield Assay Office, at the comparatively early age of fifty-two, was received with a feeling of painful surprise. The Mastership of the Assay Office has been in the Watson family for over sixty years; consequently Mr. Watson was thoroughly identified with the silver trade of the town. He had, however, strong literary and artistic tastes, which brought him into intimate fellowship with a much wider circle. He was president of the Sheffield Literary and Philosophical Society, before which, on October 1st of last year, he read a paper, afterwards published, on the Sheffield Assay Office, which was practically a history of the silver trade of the town. To those who were privileged with his intimate acquaintance, and were consequently on visiting terms with him, his house in Broomhall Park presented the very embodiment of taste and culture. Although far from being in robust health, his death at Harrogate, where he had gone for rest and change, was quite unexpected by the majority of his friends.

The mention of the Assay Master recalls the fact that the present Assay Office is the third building in succession which has done duty as such since the institution of the Sheffield Assay Office in 1773. The first meetings of the Wardens were held at the sign of the George, but it was not long before the young institution was safely housed in premises in Norfolk Street, which, after some structural alterations, were deemed sufficient for the business of that day. The next Assay Office, especially erected in Faregate, was built in the substantial, though somewhat heavy and wholly un-ornate, style in vogue in the beginning of the century, and might have stood there till to-day had not the street improvement scheme necessitated its removal. The present building in Leopold Street is a graceful stone structure, surmounted by the carved lion which did duty in a similar position on the old building, and thus marks the continuity of the office.

A meeting of the medical men of the town has just been held at the Firth College to emphasise the evils of the smoke nuisance. In Sheffield the smoke, like the poor, is always with us, and we are in no danger of forgetting its presence. But it certainly does seem necessary to rouse us out of the lethargy of hopeless despair of its ultimate abolition into which we have fallen. From certain incidental allusions in metropolitan newspapers and magazines I infer that Londoners think they live in a smoky atmosphere. They don't know what smoke is. I have seen healthy trees and blooming flowers in the heart of London. In the same position in Sheffield even grass won't grow. In the centre of the town windows may not be opened lest the contents of the room be ruined with smut. At the aforesaid meeting the doctors told us all this was bad, as though we did not know it. What we want to know is how to stop the smoke without stopping the process of manufacture, of which it is a sign.

The annual distribution of prizes in connection with the

Technical School has just been held, with Sir Frederick Thorpe Mappin in the chair. The platform contained a goodly number of gentlemen interested in education generally, and Professor Ripper, the principal of the school, gave a somewhat glowing account of its progress. The day classes are little better than nominal, but the night classes seem to be attended by a large and growing number of the right sort of students. It must be confessed that the speeches delivered were a trifle vague, and went far to justify the conduct of those manufacturers who, according to the chairman, looked somewhat coldly on the institution. Perhaps a remedy for this may be found in following the advice of one of the speakers, who urged that manufacturers should visit the classes and see for themselves what is being done. In any case, if the school does for the durability of the manufactures of the town what the School of Art has done for their ornamentation, its will have more than justified it existence.

The bills and other documents connected with the Cutlers' Feast of 1790, alluded to in last month's "Notes," have just been presented to the Cutlers' Company by Arnold John Ward, a descendant of the Master Cutler for that year. In addition to the accounts of the Feast, the documents include a list of persons invited to the Feast, a copy of the invitation cards, and other interesting papers. The gift was gladly accepted by the company, who are hopeful that Mr. Ward's good example may be followed by others who happen to have similar records of the past in their possession, and that thus a collection may be formed which cannot fail to be of great historical interest.

Two very interesting loan collections have just been added to the Mappin Art Gallery—one from the National Gallery, and the other from South Kensington. The National Gallery collection consists of a series of sketches and water-colour drawings by Turner; that from South Kensington of some fine specimens of the silversmith's art. These latter are arranged in four cases in Gallery No. 4, and will afford our art workmen an opportunity of seeing what their predecessors were capable of doing a century or two ago.

General Items.

On the 18th ult. a daring robbery was effected from the jeweller's shop of Mr. A. M. Cross, Queen Street, Burslem, and several pounds worth of jewellery were stolen.

Last month the prizes to the children of the Orphanage of the Jewellers', Watchmakers', and Goldsmiths' Trades (Paris) were presented in the great Salle des Fêtes by the Minister of Public Instruction. An interesting public ceremony was the result, and the proceedings evoked great enthusiasm.

The Geelong (Australia) chaff-cutters are on strike, and the Melbourne Jewellers' and Watchmakers' Society have voted them £5.

A warrant was applied for in September at the Bombay Police-court against Captain Charles Norman, who is charged with defrauding two native jewellers to the extent of between 2,000 and 3,000 rupees. Captain Norman went out in the employment of Messrs. Henry S. King and Co.

The Birmingham Society of Operative Jewellers held a meeting last month at the Middle Class School, Frederick Street, Birmingham, "for the purpose of discussing matters affecting their condition and future prospects." Mr. Grant was in the chair. The following two resolutions were carried *nem. con.*:—1st, "That this meeting of working jewellers considers that the prosperous condition of the trade justifies them in expecting an increase upon the wages paid for their work, as the present prices are in many instances those which prevailed during the severe depression that has now passed away." 2nd, "That an increase of wages can only be secured by the men engaged in the trade combining together for united action, and this meeting pledges itself to join the Operative Jewellers' Association, and would strongly urge upon all jewellers to do the same, in order that prompt action may be taken." Mr. Chatwin and Mr. Allen (secretary) were the respective movers of the resolutions.

Watch No. 5,000,000, now nearing completion at the American Waltham factory, will be presented when done to the Treasurer, Mr. Royal E. Robbins. It is a sixteen size, first quality movement, and will be finished without regard to cost, and will be a handsome gift. The presentation will in all probability be made with appropriate ceremonies.

In a recent report Mr. Gilbert Redgrave describes the art activity which thrills through the industrial life of a German community. He exemplifies the case of the town of Gmund, in Wurtemburg. Out of fifty-seven works sent for exhibition from this place the following craftsmen contributed:—Eleven goldsmiths, five silversmiths, five gold engravers, two silver engravers, four steel engravers, three chain-makers, four locksmiths, five tailors, two joiners, one shoemaker, one bookbinder, one gunsmith, two turners, one jewel-case maker, two mechanics, one cooper, two metal-pressers, one saddler, one ring-maker, two sculptors, and one painter.

It is reported from Zurich that a quantity of small rubies so ingeniously stuck together as to avoid detection are in the market. They are said to be genuine stones, but being small are of little value. This is reviving an old attempt at a deception practised some years ago when diamonds, rubies, and emeralds, similarly treated, were palmed off upon the unwary as the genuine article, but were known in the trade as doublets.

We have received a price list of jewellers' requisites from Mr. Charles E. Rose, Bridge-street, Bolton. The catalogue includes all the usual accessories used in the trade, but attention is especially called to Rose's soldering fluid and easy-running hard solder. A specimen of the latter we have tried seems to answer its description very well, as it makes a good joint, and melts at a low temperature. The catalogue is accompanied by a small treatise on jewellery-repairing, which the working jeweller should find extremely valuable.

According to the latest consular report, jewellery is chiefly imported into Egypt from France, French jewellery being more to the taste of the Egyptians than English.

We have had an opportunity of inspecting some of the designs of grape jewellery referred to in the advertisement of Mr. W. H. Walter, 31, Newgate Street, E.C., and are much struck with the perfect imitation of the real grape which has been attained. Great skill has been displayed in producing the natural colours and delicate bloom of the luscious fruit as well as in designing novel and artistic mountings. As the prices are very moderate, we expect to hear that grape jewellery is in large demand, and forms one of the leading novelties of the approaching season.

Pearl fishing in the Tay is still carried on, though to a smaller extent than formerly, and last month, we are informed, a lady of the neighbourhood was presented with a brooch in which were forty Tay pearls, six of which were large and valuable.

Messrs. H. J. Cooper and Co.'s catalogue, of which we reviewed the advance sheets some time since, is now out in finished form, and is a very elegant work of the kind indeed. Great care has evidently been taken in revising the interior contents, and with its gold-lettered cover it forms an almost perfect price list, which every retailer should consult in order to be up with the times.

Every shopkeeper should know the great importance of making his show window as attractive as possible. With jewellers it is almost more important than with any other retailers. We therefore call attention to the new "Reform" watch and jewellery tickets, which are illustrated herewith. The ticket and hook are in one piece, and a large variety of suitable inscriptions, such as those shown in the illustrations, are gold blocked on those kept in stock by all material dealers.

Messrs. Raphael and Co., of 13, Oxford Street, are once more in the field with a novelty for the amelioration of those who are obliged to wear the indispensable, but often comfortless, pair of spectacles. This consists in the addition of a little rubber tip to the end of each arm of the spectacle, and most effectually overcomes a well-known nuisance in the shape of the arms becoming loose and so slipping from behind the ears, or of their being too tight or rigid and so chafing the wearer's head. No doubt the invention will be widely taken up by both trade and public —by the latter because it can be applied to any spectacles, old or new.

THE DIAMOND MARKET.

In the Amsterdam market they are, as usual, grumbling about the price for rough, but are advised by their organ, *De Diamant* not to wait for any reduction. Almost the same conditions prevail as were chronicled last month.

Some good parcels were disposed of recently in Paris, and more activity is general in that market.

The London market has been short of stuff now for some time past, and all the current stuff sold at once. Buyers are a bit shy, but if they want the stones they have to pay the prices demanded. Like our Amsterdam contemporary, we would advise them to pay up cheerfully, for there is no prospect of a fall at present.

METALS.

The metal markets have been generally steady. The latest official quotations are:—*Silver.*—Bars, 48⅝d. per oz. *Copper.*—Chili bars, G.O.B.'s and G.M.B.'s, cash, £59 5s. to £59 12s. 6d ; three months, £59 15s. to £60 2s. 6d.; English tough, £64 to £64 10s.; best selected, £67 to £67 10s.; strong sheets, £72 to £73. *Tin.*—Fine foreign, cash, Straits, £103 to £103 10s.; Australian, £103 to £103 10s.; three months' Straits, £100 to £100 10s.; English ingots, £104 10s. to £105. *Lead* is strong. Spanish, £14 10s. to £14 12s. 6d.; English, ordinary, £14 12s. 6d. to £14 15s. *Spelter* is quiet. Ordinary brands, £25 to £25 2s. 6d.; special, £25 2s. 6d. to £25 5s. *Quicksilver.*—The importers' price is £10 10s.; and second hands, £10 4s.

THE CRYSTALLOGRAPHY OF GEMS.

By W. J. Lewis Abbott, F.G.S.

(*Continued from page* 91.)

The Isometric System Concluded. - Crystallography of the Spinel.

FOR simplicity sake, it would perhaps have been better to have taken the spinel first; but one feels a sort of instinctive repulsion from giving the spinel precedence in anything over the diamond; moreover, it has a habit of putting on conditions of complexity that I have not felt necessary to describe in connection with the diamond, viz., *twins* and *macles*, which only rarely occur in diamonds, but which are quite common with spinels.

I have been engaged for many days looking over crystals of spinels, searching for different shapes, and in the end have not got twenty specimens, or half-a-dozen varieties, besides those occurring with the faces of the octahedron; we may therefore say that that figure is the commonest form of the spinel.

The greatest tendency of distortion amongst the octahedra seem, the over-development along the girdle, making the crystal half again or twice as long as it should be, and transforming its apex—which should be only a point —into a chisel-shaped edge.

Another much more difficult form results from the development of plane *a*, Fig. 1., below the girdle, and the plane *f* of the same figure above; a number of these forms lie before me with this peculiarity in all degrees, until at last not only is plane *c* and *d* obliterated, but planes exist in their places at exactly the opposite angles, giving the crystal the appearance of a rhombic prism.

Next comes the *hemihedral* form, the *tetrahedron*, Fig. 4, a figure composed of four equilateral triangular faces, resulting, as before observed (page 90), from the over-development of the alternate faces of the octahedron; with an infinite variety of intermediate forms, the limits of which are the octahedron at one end, and the tetrahedron at the other. Both forms occasionally occur facetted; but so far as my observation goes, only rarely, although several of such now lie before me, both simple three-faced, and three-faced and octahedron combined. In a number of them the three faces are irregularly developed, perhaps two only on one face, which naturally distorts the crystal somewhat; or perhaps worse, some are simple, some two faced, and some three; while here and there one adds to the complexity by putting on faces of the cube, and rhombic dodecahedron.

Furthermore, the tetrahedron and the octahedron have a habit of putting on other faces of the same *form*, in steps rising *apparently* at right angles to the plane of the face, and occurring by no means in the centre of the crystal; their angles, however, are always those of the octahedron, giving the crystal the appearance of having slices of other octahedra stuck upon them; but however much nearer one side they may be than the other, they will always be seen to have their sides parallel with those of the crystal to which they *appear* attached (but of which they of course form a part). In the combination of an octahedron and a tetrahedron to an equal extent, three of the faces naturally become triangular, and the other three hexangular; upon any of these hexangular faces these triangular faces may occur (or *vice versâ*), but to which they bear no relation of outline save the angular agreement of the edges of the triangle with every first and third of the hexagon. These may occur in any size, but they differ from the triangular markings on the face of the diamond; for in that instance we saw that the apices of the triangles always point towards the girdle irrespective of their size, whereas in this case they point from it. I have, however, a specimen of spinel which shows the same markings as the diamond, which fully bears out the origin claimed for them (page 90); and further, other combinations of the octahedron and cube occur in all stages, especially the earlier stages.

Twins and Macles.—A characteristic of the spinel is to form a number of crystals together without any being perfect, the angles being relatively constant, of course, but not a perfect crystal amongst them; these we may call *twins;* groups or clusters of nearly perfect crystals also occur. There is another form by no means rare, of a very peculiar shape (Fig. 6); it is as though the octahedron had been cut obliquely through, and one-half twisted through 90°, and stuck together again; of course, no such action has taken place. It thus forms a figure upon a triangular base, the faces of which are bent out, and edges bent in, at similar angles along the centre. The height of this may be reduced to any degree of thinness, and the re-entering angles become almost obliterated, and faces may be built up upon the triangular faces. This is the form referred to in connection with the diamond: like two cleavages stuck together. In the case of the octahedral macle, the re-entering angles at once distinguish it, but when tho rhombic dodecahedron becomes macled, there are no such re-entering angles; but the upper and lower faces remain untouched, and their angles with the adjoining faces 120° unaltered, whilst the central faces alone become distorted, and the general outline of the figure altered somewhat; but one soon gets to recognise this form of this macle as readily as that of the octahedron.

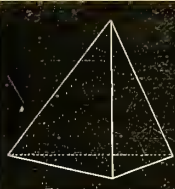
FIG. 4.

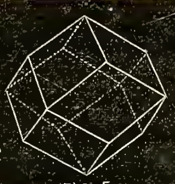
FIG. 5.

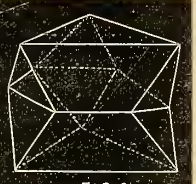
FIG. 6.

The chief crystallographic forms of the spinel are—

1. Octahedron (principally), somotimos three-and-six faced.
2. Tetrahedron (frequently), often combined with 1.
3. Rhombic dodecahedron (occasionally), sometimos combined with 1 and 4.
4. Cube (very rarely), sometimes combined with 1, 2, and 3.
5. Octahedral-macles (very frequently); of all heights these forms are sometimes assumed by the diamond.

Crystallography of the Garnet.

The third and last gem that crystallises in this system is the garnet, but it will strike one at a glance at the above figures—7 to 12—that although crystallising in the same system, their habits, or forms in which they occur, are quite different in general from those of the two other gems preceding, and although it is possible for an octahedron to occur in garnet, and a rhombic dodecahedron in spinel, their occurrence is so rare as to cause one not to fear being mistaken in them; and although spinels occur in octahedra as well as the diamond, the rarity of the former in white would probably make them of about the some value, but we shall have other characteristic features explained by-and-by, which will be called to our aid for the casting vote in cases like these.

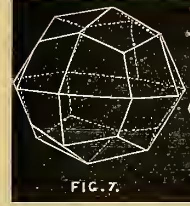
FIG. 7.

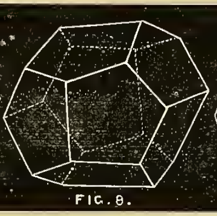
FIG. 8.

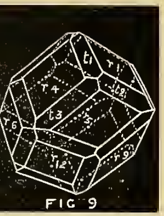

FIG 9

Why crystals of the same substance should put on different habits is a mystery that we are at the present by no means able to explain. If the garnet occurred in ten times as many forms as it does, we might realise its justification when we remember its complex and varying composition. But when we come to a crystallised *element* like the diamond, we are led to think that *conditions* of crystallisation play as important a part as chemical composition; and although there are certain great and well known laws of *isomorphism*, or substances of similar type taking similar forms, there are other things which show that mode of origin and environmental conditions have a great deal to do with the form assumed. This we know to be the case from our own experiments and experience in artificially preparing crystals. I have seen my friend, Mr. W. Symmons, able to tell from which side of a hill certain crystals came simply by their form; and as with Cornwall, so with other parts of the world—in certain parts one form predominates, and in others another; but these will probably be spoken of under the mineralogy of gems.

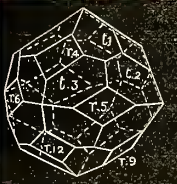

FIG. 10

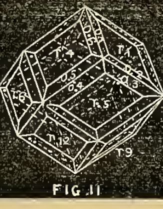

FIG. 11

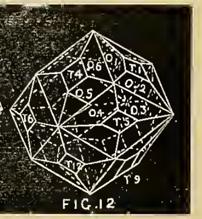

FIG. 12

It is a little difficult to say which is the commonest form of garnet. Haidinger regarded the rhombic-dodecahedron as its characteristic form, and accordingly named it the *granatoid*; as did Weiss, who called it the *granatohedron*. Perhaps they were right, but usually they are not simple forms, although good deltohedra, Fig. 7, and pentangular-dodecahedra, Fig. 8, are by no means rare: they, however, usually occur in combinations.

There is one feature that it is very necessary to understand in *reading* a garnet crystal, viz., the extent to which any special face is developed, thus Figs. IX. and X. (both common habits of garnet) are in reality both the same forms, although they appear so dissimilar. It will readily be recognised that Fig. IX. is the same as Fig. V., only the edges of the rhombic-dodecahedron are cut off and replaced by a plane, the plane being that of the twenty-four-faced trapezohedron. In Fig. X. we see trapezohedral faces still further developed, and the rhombic less so, with the result of a very different figure (which difference might be greatly augmented if we figured the extremes). The corresponding faces in the two are similarly lettered and numbered. In my own collection I find I have a greater proportion of this form than anything else. The same may be remarked of Figs. XI. and XII., both of which are combinations of the rhombic-dodecahedron and the six-faced octahedron. In the former the dodecahedral planes are the more largely developed; and in Fig. XII. those of the six-faced octahedron. Similar combinations of other forms occur, as of the deltohedron, Fig. VII., and the rhombic-dodecahedron, Fig. V., with the same relative differences.

The garnet, too, has that peculiarity of putting on faces of the same form in apparent steps; this I have especially noticed in the rhombic-dodecahedron. One before me shows ten such steps on one face; nor are they always rhombs! Sometimes they are so notched, as it were, as to have a number of points instead of one; the angles on both sides of the notches are, however, constant, and identical with the sides of the rhomb upon which they repose. In other specimens this feature leads up to the twenty-four-faced trapezohedron; indeed, in some crystals before me, in some of the faces *steps* are visible, while in others the edge becomes quite angulated, as Fig. IX.

The principal crystallographic forms of the garnet are:—

1. Rhombic-dodecahedron, Fig. V., and combinations.
2. Deltohedron, Fig. VII., often combining with 1.
3. Octahedron (in ouvarrowite), in the other garnets as facetted combinations with nearly all the other forms.
4. Cube (extremely rarely), and in combinations of nearly all the other forms.
5. Trapezohedron, and in combination with other forms.
6. Pentangular-dodecahedron, and in combination with other forms.

(To be continued.)

Note.—In the last article the word "dodecahedron" was the victim of typographical errors. Also Fig. 1 should have had all lines of equal thickness; as it stands it is a little difficult to realise the true relation of the figures: this is easily remedied by making the upper line that bends along the centre a little darker with the pen.

MECHANICAL OCULAR DEFECTS.

THEIR NATURE, CAUSE, CORRECTION, AND RELATIONS TO FUNCTIONAL NERVOUS DISEASES.

WE HAVE seen, says Dr. Bucklin, continuing his series in the *Jewellers' Circular* on the subject, that convergent strabismus resulting from hyperopia is not a morbid condition; it is simply a symptom which may arise when the hyperopia disturbs the relations between fixation and accommodation to such a degree that at no point for which the individual can fix both eyes can he accommodate. The disturbed relations above mentioned which make it advantageous for the individual to squint may exist as a result of the hyperopia alone. Frequently a combined condition of hyperopia and weak ocular muscles is the cause of the trouble. This makes it possible for strabismus to exist with any degree of hyperopia, without hyperopia, or with even slight myopia. In cases where it exists with slight degrees of myopia or emmetropia, the weak condition of the muscles is the element which disturbs the relation between fixation and accommodation to such a degree that squint follows as a symptom.

Squint is always a symptom of some other trouble, and never exists as an independent condition.

There is only a small percentage of hyperopic persons who develop convergent strabismus. No hyperopic person has any desire to look cross-eyed, providing he can see distinctly with both eyes without looking cross-eyed. No hyperopic person will look cross-eyed who cannot see distinctly with both eyes, unless he can learn the art necessary to avoid double vision when both eyes are not directed at the same point. This statement is beautifully illustrated by the following experiment: If a concave glass strong enough to be difficult to overcome is placed before one eye, and the other eye is covered, this eye will deviate inward when any attempt is made to produce sharp vision in the eye not covered.

The natural abhorrence of double vision is the only thing which restrains all non-facultative hyperopes from developing convergent strabismus. The question which now suggests itself is—What circumstances must cooperate to give rise to strabismus in hyperopic individuals? Donders was the first to consider this matter in a systematic manner, and I consequently give his deductions as being those which most subsequent authors have followed. He states that the circumstances which lead to the development of convergent strabismus are of a two-fold nature.

First—Those which diminish the value of bi-nocular vision.

Second—Those which render convergence easier.

Congenital difference in the accuracy of vision or in the refractive condition of the two eyes.—In hypermetropia the accuracy of vision is often imperfect, whether in one eye or in both eyes. This is in part attributable to astigmatism, in part to a still unknown imperfection of the retina. If the diminished accuracy of vision affects only one eye, then on too great convergence the image of the eye will not so much disturb vision. The same is the case when the degree of H in the deviating eye is greater, and the image in this eye is therefore less accurate. In either case, consequently, strabismus will more easily arise. But the tendency doubly increases when both circumstances, a higher degree of H and diminished accuracy of vision, as is often the case, occur combined in the same eye. If the eye has long been deviated there arises a secondary diminution of the accuracy of vision as a result of strabismus, to which I shall subsequently revert. In that case, however, we can, with the aid of the ophthalmoscope, often demonstrate a still higher degree of *H* of this eye.

Spots in the Cornea.—It is often remarked that in oblique vision the deviated eye, or indeed both eyes, exhibits opacity, or spots on the cornea. Pagenstecher and Saemisch have recently called attention to the frequent occurrence of corneal spots in strabismus. It does not appear to me, however, that spots on the cornea should, in themselves, be capable of exciting strabismus. Although the image of the second eye is less perfect, experience shows that even then the preference is given to bi-nocular vision; nor is it explicable that one of the eyes should be inclined to deviate, merely for the purpose of making it quite different, rather than it is true, an unequal, but still corresponding, image should fall upon the yellow spot. Ruete has, upon good grounds, in this way decided the contest between Beer and Joh. Mueller. But it is quite a different question whether, where hypermetropia exists, specks on the cornea and other obscurities might not increase the tendency to strabismus, whether the less accurate image in the visual axis might not make the image less disturbing, and diminish the abhorrence of an accessory second image. I am very much inclined to assume this. At least, I find specks on the cornea much more common in hypermetropia with strabismus than in hypermetropia without strabismus. It is true there may be still another connection between specks on the cornea and strabismus, to which Ruete has already directed attention, namely, an inflammation which produces these specks on the cornea may extend beneath the conjunctive to the same of the muscles or their envelopes, and produce, first, a spasmodic, and afterwards a nutritive, contraction. Such cases I have already mentioned. They are, however, comparatively rare, but they may in part explain the preponderance of specks on the cornea in hypermetropia with strabismus.

In the second place, as I have remarked, the origin of strabismus is promoted by circumstances which render convergence easier. Under this head are to be noted—

Peculiar structure or innervation of the muscles; easy mobility of the eyeballs inward.—Not unfrequently a congenital insufficiency of the musculi recti enterni occurs. It may readily be assumed that the opposite also may be the case; and, in fact, some eyes converge without any particular tension up to three inches, nay, up to two inches, and less from the eye. We may assume that form and position of the eyeball exercise as much influence in this respect as the structure or innervation of the muscles.

Now, while in insufficiency of movement inwards we have a guarantee against strabismus convergence, free motion in this direction will increase the tendency to this form of oblique vision. By many the latter can, in a high degree, be easily produced at will; by others not at all, or only with great difficulty; and when it is stated that such voluntary squinting often produced for the sake of imitation, or of mockery, has with some given rise to permanent strabismus, I readily admit it, but on condition that hypermetropia at the same existed. Moreover, I have not been able to satisfy myself that a special tendency to strabismus may be hereditary. Let me be understood. In a very high degree hypermetropia is hereditary. It is a rare thing with hypermetropic structure of the eyes in one of the parents, not to find hypermetropia also in some of the children. But whether this hypermetropia in the parents was combined with strabismus or not, has, if any, certainly only slight influence in the development of strabismus in the hypermetropic children born to them. If in a family one or two labour under strabismus convergence, we may be sure that in some other members hypermetropia will occur; but that in the same family most of the hypermetropics should be affected with strabismus has very rarely occurred to me.

Relations between the visual line and the axes of the cornea.—We have already seen that in general in hypermetropic individuals, in order to give a parallel direction to the visual lines, a more than ordinary diversion of the visual axes is required. Thence we have in so many hypermetropic persons apparent strabismus divergence. On the other hand, we know that most eyes can with difficulty be brought to a state of divergence; a weak prism, with the refracting edge held outwards before the eye, produces double images, which most people are not able, by divergence of the visual lines, to overcome. Even for the sake of single vision many do not succeed in diverging some degrees more. It is, therefore, natural to assume that when for single vision more than ordinary divergence of the corneal or visual axes is required, the divergence may very easily be insufficient, and that accordingly, as a matter of course, for seeing at a shorter distance also, there may readily be had great convergence. What was treated of under the first heading facilitates convergence in an absolute manner. Comparatively the relation between the visual line and the axis of the cornea has in hypermetropics the same result. Now, if in looking at a distance the requisite divergence of the axes of the cornea easily falls short, the convergence will likewise, under the influence of the hypermetropia in looking at near objects, be relatively too great. The condition for the development of strabismus is thus given. In fact, it often seemed to me that in squinters after tenotomy, a considerable degree of divergence of the axes of the cornea was required to make the visual lines assume a parallel position. Often the eyes are apparently quite properly directed, and yet when fixing a remote point one and the other eye are alternately covered with the hand, we observe that the eye just opened has each time to make an extensive movement outwards to fix the remote point. Sometimes this is in so great a degree the case that, for bi-nocular vision at a distance, a deformity by divergence would be required. This leads me to suspect that while in general the great angle *a* promotes the occurrence of strabismus, in order to test this suspicion the angle *a* was measured in ten cases of strabismus convergence. The measurements were in great part made by Mr. Hamer, according to the method already described, with his usual accuracy.

The above set of reasons as to why certain hyperopes squint, while many others do not, have been handed down to us in every text-book which has been written since 1857. The reasoning is truly classical, but time has to my mind demonstrated that it is not correct in many respects.

First, *congenital differences in the vision or refraction of the two eyes*, which he gives as a cause for the development of squint in hyperopes, will not stand the test of investigation. If a hyperope finds it unnecessary to squint for the purpose of producing acute vision, the existence of the above conditions will never make squint a necessity. If a hyperope is unable to see distinctly with both eyes, the above-described condition in one eye will determine which eye will be the squinting one, but this condition will never occasion the development of convergent squint in a person having facultative hyperopia. It is a question if a non-facultative hyperope with both eyes perfect will not learn to squint, if it is necessary to do so, quite as easily as the person who has one eye which is slightly defective, but still has bi-nocular vision.

Spots on the cornea in persons having bi-nocular vision are very seldom, if ever, a cause for the development of convergent squint. We find so many persons having nonfacultative hyperopia with spots on the cornea who do not squint that this position becomes a difficult one to defend.

Peculiar structure or innervation of the muscles has also failed to hold its ground as a cause of strabismus.

Donders's measurements regarding the relations between the visual lines and the axes of the cornea have failed to receive support from others who have experimented with these measurements, since they have not found any special relations between the angle *a* and convergent strabismus. Landolt, in his last book, follows all the reasoning of Donders, and adopts most of the reasonings as established facts. He quotes Manthner as saying, "*That if all hyperopes do not squint it is because only a small number know how to perform the act* (Mauthner Die Optischen Fehen des Anges, p. 557)." Mauthner really says, "That every hyperope who cannot see without squinting, but who could see by squinting, would look cross-eyed if he knew how to do so." Landolt finishes by saying that none of. the enumerated theories explain all the cases of convergent squint, and he prefers to acknowledge that many cases of convergent squint are beyond our comprehension. I think the explanation of Manthner is full and complete, and accounts for every case I ever met with where convergent squint is resorted to for producing acute vision.

Convergent strabismus is a "trick," by which difficulties in the relations between fixation and accommodation can be overcome; all persons having use for this "trick" will use it, providing they can learn how.

THE OUTPUT OF THE DIAMOND MINES.

UNTIL 1882, no official returns of diamond finds were kept. Between 1873 and 1880 the output was variously estimated up to three million carats. The official returns of the annual finds in and since 1883 are as follows:—

Year.	Carats.	Valued £.
1883	2,312,324	2,359,466
1884	2,204,786	2,562,623
1885	2,287,261	2,228,678
1886	3,047,639¾	3,261,574
1887	3,646,889	4,033,582
1888	3,565,780¾	3,608,217

This gives an average annual find during the six years of 2,844,113 carats, and during the last two years an average of 3,606,335 carats. There are 150 carats in an ounce troy. The total quantity of diamond "finds" weighed about five tons.

LIVERPOOL WATCHMAKERS AND JEWELLERS.

A MEETING of the general committee of the Watchmakers' and Jewellers' Association was held on Tuesday, the 21st ult., in the Cocoa Rooms, Commutation Row, when there were present: Mr. John Bryant, in the chair, Messrs. W. Wilday, W. Burgess, J. Edwards, Edward Bellis, W. H. Dumbell, John Latimer, W. J. Nash (treasurer), and A. E. Newcomb (secretary). The following resolution was moved by Mr. William J. Nash, seconded by Mr. J. Edwards, and carried after considerable argument:—"That this society of watchmakers and jewellers at present constituted at a monthly subscription will on and after the 1st of January, 1891, fix an annual subscription of 5s., with monthly committee meetings and quarterly general meetings."

A MONSTER PENDULUM.

FOR some time past a gigantic pendulum has been visible swinging from the second platform of the Eiffel Tower, and reaching almost down to the base of the huge metallic monument. Few persons were aware of the purpose for which this mighty apparatus was intended, but the matter has now been courteously explained by M. Mascart, Director of the Central Meteorological Bureau, and a member of the Academy of Sciences. This gentleman and his colleagues have put the big object in its present place in order to try an experiment made in the Panthéon by Foucault in 1851, which had for its aim to determine, by the oscillation of a pendulum, terrestrial motion and the rotation of the earth. The experiments of M. Mascart and his friends have not yet taken place, as calm, unruffled weather will be required for them. Nothing that has been hitherto unknown will result from the observations to be made, but they will prove interesting, owing to the immense length of swing which the pendulum has from the second platform of the great tower. Foucault's experiments in the Panthéon failed, as M. Mascart points out, because the pendulum used had but a drop of sixty mètres from the cupola of the building, whereas that affixed to the Eiffel Tower is twice as long. The huge piece of mechanism, which moves for an hour without stopping, may be considered, while it remains where it is, as a notable curiosity of Paris, worthy of being visited by strangers from other lands.

COVENTRY WATCH TRADE ASSOCIATION.

THE committee of the above association held a meeting on Tuesday evening, the 7th ulto., when a letter was read from the London association in reference to the recent prosecution of a London tradesman for infringing the Merchandise Marks Act, and the committee, believing that the action of the London association was of great benefit to the watch trade generally, unanimously voted a sum of £5 5s. to its funds, that sum being as much as the committee felt themselves justified in voting, owing to the limited funds at their disposal It was also decided to make an urgent appeal to the trade generally so as to enable the association to get a fund sufficient to warrant them in voting a larger sum when important prosecutions such as the recent case are undertaken. It is well known that the various clauses of the Merchandise Marks Act are now being evaded, and a lager amount of foreign material is being used, under circumstances which the Act makes illegal.

FRAUDULENT JEWELLERY IN FRANCE.

THE Paris police have cleverly succeeded in discovering the perpetrators of an extensive forgery in hall-marks. Complaints having been made that fraudulently-marked wedding-rings were being sold in different shops, an inquiry was made, the result of which showed that the rings in question were manufactured by a M. Marret, in Havre. Marret now accuses MM. Moncault, a firm of manufacturing jewellers, of having supplied him with rings of base metal for the purpose of being fraudulently stamped. The case has been taken up by the Paris Jewellers' and Goldsmiths' Syndicate.

THE SILVER PLATE INDUSTRY.

THE fourth annual dinner of the federated societies connected with the silver-plate industry took place last month, under the auspices of the Silver Trade Council, at Anderton's Hotel, Fleet Street, E.C. The tables were laid for 150, and every seat was occupied; Mr. J. Jarvis presiding, and Mr. F. B. Tasker being in the chair. The customary loyal toasts having been duly honoured, the Chairman proposed "The Federated Societies," and in doing so said when they last met their number was 109, but on the present occasion they showed an appreciable increase. He was convinced unionism was the right thing, and after dwelling upon its many advantages, and pointing out what it had done towards protecting their trade, he recommended any body of men who were not organised, or not thoroughly organised, to take the matter in hand without delay. He had a very pleasing duty to perform on that occasion, which was to make a presentation, in the name of the federated societies, to an old and tried friend of the union—Mr. J. W. Lloyd, who was the father of the Silver Trade Council After officiating as chairman for three years, Mr. Lloyd thought he would like a rest, and upon his retirement it was unanimously decided to give him some tangible proof of their respect and esteem. The chairman then presented him with a silver épergne, mounted on an ebony stand, the design being an oak tree with leaves and acorns, upon which rested a handsome cut-glass flower vase. The base of the épergne represented a rock, with a resting fawn and a stag, and a suitable inscription was engraved on a highly burnished tablet.

The toast was responded to by Mr. S. Whitaker for the silver-plate workers and spoon makers, by Mr. Judd for the silver-plate polishers and spoon finishers, and by Mr. Davis for the silver-plate chasers.

Mr. J. W. Lloyd, in acknowledging the honour they had done him, said he would now have more cause than ever to work for the well-being of the organisation. Before the council was formed men could scarcely get work; now masters could scarcely get men to do the work.

The next toast was "The London Trades Council," proposed by the vice-chairman.

Mr. George Shipton, secretary of the London Trades' Council, in replying, congratulated them on the earnest devotion they had shown to the cause of unionism. The best work of the Trades Council was done behind the scenes, so to speak; and it was only by persistent efforts that they could achieve success. He believed, however, that if they stood to their colours right and truth would eventually conquer. He had been many years connected with trade unionism, and for 18 years he had been secretary of the Trades' Council. During that period it had gone through many vicissitudes, and 17 years ago, under the Trades Act, the gas stokers were imprisoned for breach of contract. The council met them on their release and took them under their wing, and when on a subsequent occasion some other men were imprisoned, they were also taken by the hand on their release, and each man was presented with 10 guineas. Such legal penalties could not be enforced now, thanks to the efforts of the Trades Council, which were ably seconded by the various unions. George Odger, who worked hard in the cause of the union for a number of years, had the large stipend of £6 per annum as secretary, and when he (Mr. Shipton) succeeded him as secretary there was six years' salary due to him. Mr. Shipton then went on to describe the action of the Trades Council in reference to the various difficulties which arose between masters and men, and urged that by federation trade had advanced both generally and in detail. There were now 100 trade societies federated; and 12,000 dockers were now in the federation. Unless working men were protected by unionism, labour would be paid for as badly as ever. He therefore claimed of workmen that they should throw all the interest they had into the cause of unionism.

Mr. F. Britten next proposed "The Silver Trade Pension Society," to which Mr. B. F. Newton, secretary, responded.

"The Silver Trade Council" was given by Mr. Thomas M'Intyre, and responded to by the secretary, Mr. John Griffiths.

A musical and vocal concert filled up the remainder of the evening.

MALPRACTICES IN THE JEWELLERY TRADE.

IMPORTANT PROSECUTION IN BIRMINGHAM.

IN the Second Court at Moor Street, last month, before Messrs. A. Chamberlain and G. H. Lloyd, Edward Meredith Evans and Edward Masters Evans, goldsmiths, of Northampton Street, were summoned by Messrs. Blanckensee and Sons, jewellers, for selling three bracelets to which a false trade description had been applied, and also for applying a false trade description to three bracelets. Mr. Stubbins appeared to prosecute on behalf of Messrs. Blanckensee, Mr. Hugo Young defended, and Mr. J. L. Porter watched the case on behalf of the Silversmiths' and Jewellers' Association.—Mr. Stubbins, in opening the case, explained that the proceedings were taken out under the Merchandise Marks Act, 1883, and the facts of the case were these:—Messrs. Blanckensee and Sons, who were jewellers in Frederick Street, dealt in what were called gold bangles, and prior to a date to which he should draw their attention the price which they had been paying for 9-carat bangles was 48s. per ounce. Now, it appeared that on a certain date in July, he believed it was the 25th, Mr. Edward Masters Evans, the son of the other defendant, happened to be at the warehouse of Messrs. Blanckensee, who had then received an order from London for some six dozen of those bangles. He mentioned this fact to Mr. Evans, and he said that he could do them at 45s. per ounce. One of the clerks in the employ of Messrs. Blanckensee came down and said, "Don't make them too heavy," because they run about four or five to the ounce. However, an order was given, and was given for 9-carat hall-marked bracelets, to be supplied at the price of 45s. per ounce. On the 16th of August, which was the date now before their worships, the first lot of bracelets, consisting of some eighteen, arrived. They were invoiced to Messrs. Blanckensee by Evans and Sons, as eighteen 9-carat hall-marked bracelets at 45s. per ounce, the total cost amounting to £11 9s. Subsequently to that a gentleman named Smith happened to see the bracelets, and on being informed of their cost expressed his surprise at their cheapness, and by consent of Mr. Blanckensee broke one. It was then discovered that the inside of the bracelet contained such a quantity of silver solder that made the article, when assayed, come out at something like 6-carat instead of 9-carat. The whole of the bracelets had been assayed by Messrs. Lees and Saunders, and they would tell the bench how the goods turned out. After the discovery had been made, and after Mr. Evans's attention had been drawn to the matter, a conversation occurred between Mr. Blanckensee and Evans the elder, and he relied a great deal upon that conversation as showing what was the knowledge of Messrs. Evans. The old Mr. Evans called at the office of Messrs. Blanckensee, and a conversation occurred in the presence of a Mr. Bint with reference to the use of the silver solder, and Evans then said, "I told my son that these things could not be done honestly, and my son said that we must do as others do; and this is the result." Their worships would have to consider that the articles spoken of were sold with the reputation on the invoice that they were 9-carat; but there was no doubt whatever that instead of their being 9-carat they were only 6-carat, and that consequently Messrs. Blanckensee were being defrauded to the extent of one-third; and that although the goods had upon them the hall-mark of the Assay Office, they were not as they were represented to be, inasmuch as the hall-mark had been placed on the outside of the gold strips, the insides had been filled up, and the bangles were before the world with a false trade description upon them. They were also punched with Messrs. Blanckensee's initials, according to custom, and, therefore, were represented as being manufactured by that firm, who would have been responsible, indeed nothing could have saved them from a penalty, had any customers happened to discover that the bracelets were not what they were represented to be. He (Mr. Stubbins) should call Mr. Westwood from the Assay Office, and Messrs. Lees and Saunders, and he submitted that if he could prove that the bracelets were sold with the false description upon them it was a case which came within the meaning of the Merchandise Marks Act with regard to the question of the addition, and that it was a false trade description of the goods at the time they were sold.—Mr. Chamberlain asked whether the prosecution suggested that the solder was put in separately.

Mr. Young: I don't think that. I think they say, in the course of manufacture.—Mr. Stubbins: I shall refer your worships to the conversation which occurred between Evans and Bint.

Mr. Stubbins then called Mr. Aaron Blanckensee, who deposed that he was the managing director of the firm, who gave evidence concerning the visit of Mr. Evans, junr., to the firm, and the giving of the order for the bangles, and remarked that he might say that the bangle shown by Mr. Evans on that occasion was not hall-marked. He then went on to say that on the 20th of September Mr. Evans, the younger, called on him and told him that he had had a letter from witness's lawyer. He then spoke about settling this case, but witness referred the defendant to his solicitor. On the same day the father called, and witness had a conversation with him. He then said, "I told my son, when he took the order, that we could not do it honestly." Witness said that the matter was out of his hands, and referred Evans to his solicitor.—Cross-examined: Witness commenced the proceedings without taking his co-directors' advice.—Mr. Young: Has your conduct met their approval?—Witness: Yes.—All of them? No.—Has your conduct in this matter met with their approval or disapproval? With their approval.—The whole of your conduct?—The whole.—Do you mean they approve of all you have done, of this prosecution? Of this prosecution.—That is not what I asked you. Did they approve of all? At least they have shown no disapproval.—Does Mr. Marrion approve your conduct? I think after my explanation of what occurred with Evans.—Does he approve of the whole of your conduct in connection with the matter? I have no reason to believe that he does not.—Did he ever disapprove? When influenced by Evans he did.—Did your other directors disapprove? No.—Did Mr. Marrion tell you so? He did.—In answer to further questions, witness said he did not instruct his lawyer to settle the matter, but instructed him to follow the advice of counsel, who said that a civil action could be taken.—Mr. Young: Will you tell me how much you were disposed to take to settle the case? Witness: I decline to state.—Further evidence was given in support of Mr. Stubbins's statement, tracing the bracelets from the defendants' to prosecutors' premises, and then to the assayer's.—Mr. J. Potter, of Messrs. Lees and Saunders, gave evidence as to the assaying of several bracelets produced, and said that they fell below 9-carat, the hall-mark, some being only 6-carats as a whole, and others 7-carats. This was due to the presence of solder inside.—Mr. Westwood, Assay Master, said that the quantity of solder used was excessive, and it could have been avoided with more care. He had passed the strips as 9-carat, but he could not pass the bracelets now as 9-carat gold.—Mr. Chamberlain was proceeding to question the witness, when Mr. Young said that undoubtedly a great deal more solder was used than he should attempt to justify. The value of a carat was about 3s. 6d. an ounce.—Mr. Westwood further stated that defendants had apologised to the Assay Office for their mistake, and had paid £225.

Thomas Smith, jeweller, gave evidence concerning the breaking of the bracelet, and said that the quantity of solder used was excessive. It was more trouble to solder them inside than out. He usually used 8 carat gold solder, but he could make silver solder bracelets to be passed at 9-carat. About seven grains of solder were required for a bracelet, and it was impossible that so much as a third of the weight, about thirty-two grains, could be put in through carelessness. He also stated that the custom of the trade was to weigh out the gold and solder to the workmen, but Mr. Young said that witness could not say what Mr. Evans's custom was, and therefore that evidence was worth nothing.

In cross-examination, witness said that they soldered common goods inside, and hall-marked goods outside. It was easier to solder from the outside.—Mr. Young: Then why do you solder common goods on the inside?—Witness: Because it pays best. (Laughter.) The common goods are sold at so much an ounce, and are not stamped, but the others are guaranteed.

Mr. Henry Fitter, a goldsmith in business at 26, Hylton Street, said he had heard the evidence of Mr. Smith, and he agreed with every word of it. He had had dealings with Mr Evans.—Cross examined by Mr Hugo Young, the witness said he had often heard of soldering jewellery goods on the inside, but it was easier and quicker to solder from the outside.

Mr. John William Bint, manager to the complainant firm, said that on September 20 Mr. Evans, sen., called at his office and said, "I have called about these bracelets." Witness replied that he should see Mr. Blanckensee. Mr. Evans said, "Can't we settle this matter?" He then produced a bundle of strips, saying, "This is how they are sent to the Hall, and how they are returned to us. Of course, you know it is necessary to add a little solder now and again." Witness replied, "Yes, but that doesn't account for a lining of silver solder." Mr. Evans then seemed to get into a temper, and said, "I told my son that we couldn't do these goods honestly at the price," and my son said, "We must do as others do, or we shall lose the orders." And this is the result.

In connection with the above case, the following letter of apology subsequently appeared in the local papers:—

BIRMINGHAM ASSAY OFFICE.

TO THE GUARDIANS OF THE STANDARD OF WROUGHT PLATE IN BIRMINGHAM.

Whereas I. the undersigned, EDWARD M. EVANS, trading as "EDWARD M. EVANS AND SON," of Northampton-street, Birmingham, Manufacturing Jeweller, hereby admit that additions have been made to certain Gold Wares manufactured by me—namely, Gold Bracelets—

after such wares had been assayed and marked by you, by an undue quantity of solder being added to such wares, such additions being contrary to the Statute in force with reference to the assay of Gold and Silver Wares. Now I beg to say that such additions were made by my workmen without my instructions, and were quite unknown to me personally until my attention was called to the matter by one of my customers. I hereby APOLOGISE to you for the Offences so committed. If you will waive proceedings against me I agree to pay you, by way of penalty, and for the costs and expenses you have incurred, the sum of Two hundred and twenty-five pounds; and I also undertake that I will not hereafter make any additions, by adding any undue quantity of solder or otherwise, to any Articles made by me after the same have been assayed and marked at your Office.

I further Agree that you may Publish this Apology in such way as you may think desirable.

Dated the 27th day of October, 1890.

EDWD. M. EVANS.

Witness—Thomas Marston, Clerk to Sir Thomas Martineau,
Law Clerk to the Birmingham Assay Office.

PROSECUTION UNDER THE MERCHANDISE MARKS ACT.

AN important case respecting the marking of jewellery came up at the Sheffield Town Hall on Thursday, October 2nd, before the stipendiary magistrate. John Merritt, jeweller, of 124, South Street, Moor, was summoned by James Barlow, cabinet case coverer, of 10, Anson Street, Park, for having on August 20th "unlawfully applied a certain false trade description to certain goods, to wit, a lady's albert guard," contrary to the provisions of the Merchandise Marks Act. Mr. W. E. Clegg conducted the case for the prosecution, and the defendant was represented by Mr. Muir Wilson.

In opening the case Mr. Clegg explained that the information was laid under Section 1, Sub-section 2, of the Merchandise Marks Act, which provided that every person who falsely applied any trade description to goods should be guilty of an offence. By Sub-section 2 of the same section every person who sold any goods to which a false trade description was applied was guilty of an offence; and then, by Section 5, a person was deemed to apply a trade description to goods when he applied a label to the goods he exhibited for sale. The facts of the case were that on August 20th the complainant and a young lady named Pettitt were looking into the defendant's shop window, and there saw exhibited for sale a silver guard, at one end of which was a label attached, bearing the word "silver," and at the other end was a label with the price, 8s. 6d. The complainant and the young lady went into the shop, and at their request the defendant showed them the guard. He was asked if it was solid silver, and his reply was that everything in the case was silver. The defendant having thus warranted the guard, the complainant relied upon his statement and purchased it. A short time afterwards, however, the suspicions of Miss Pettitt, who had received the chain from the complainant as a present, were aroused, and accordingly on September 7th she had it tested by Mr. Morrison, of West Street. He decided it was simply German silver plated over. Therefore it did not answer the description which had been put upon the article when Mr. Barlow purchased it, and so the present action was brought.

Mr. Muir Wilson said that through the kindness of the other side he had that morning been able to subject the chain to an examination by an expert, for it was perfectly clear that his client coming into court on a charge of false marking should have the testimony of an independent man. Mr. James Turner, of North Church Street, who had made the examination, reported that the chain was not silver. Part of it was metal, but the ornaments were silver, although of a very common character. This being so, it became his (Mr. Wilson's) duty to be very candid, and to explain how his client came into possession of an article which he sold as silver. It would be idle for him to contend he had never applied a false trade description. Immediately on receiving the summons Mr. Merritt wrote on the 25th of September to Mr. W. Griffith, manufacturing jeweller, 35, Northampton Street, Birmingham, complaining to him he had received a summons charging him with selling as silver an article which was not silver, and which he had purchased from him. The guard had been invoiced to Mr. Merritt as silver, and he had bought it as silver. A rather curt note came from Mr. Griffith, in reply. "Birmingham, 29th September, 1890. Mr. Merritt, Sheffield, Dear Sir,—I cannot possibly come to Sheffield. Besides, what can you fear in the matter? You will find you are all right enough. If it is silver, ask them to let you assay it or to get it done. I cannot see how you can get into trouble about it.—Yours very sincerely, W. Griffith." (Loud laughter.)

The Stipendiary: That is carrying it with a high hand.

Mr. Muir Wilson: To put it mildly, that is what you might call a bold letter. (Laughter.)

The Stipendiary: It certainly is.

Mr. Wilson: My client is in trouble, and it would take a much cleverer man than Mr. Griffith to get him out. I do not see that the punishment should be laid on my client. He bought the goods on 23rd June this year, "three gent's silver fancy, 7s. 6d.," so that he only made 1s. profit.

Mr. Clegg: I am afraid it cannot be the same chain. Jewellers have more than 1s. profit on 7s. 6d.

Mr. Muir Wilson: Well, it's small profit and quick returns. When Mr. Griffith said the guard was silver he must have been mistaken and misleading my client. That being so, Mr. Merritt thought he was justified under the circumstances in ticketing the chain as silver. It was not incumbent on him to have every article tested that came into his shop. He would have to consider whether he should proceed against Griffith for having supplied an article which was not what it was alleged to be.

The Stipendiary: Then if I put on a substantial penalty you will be able to get it back from Mr. Griffith? (Laughter.)

Mr. Wilson: I am afraid not. Mr. Merritt was desirous of acting fairly, and would return to Mr. Barlow the 8s. 6d. in exchange for the chain, which would enable him to make up his mind as to what should be done, for it was clear he had been misled.

The Stipendiary said people who sold things should try to find out their quality, and not leave that to the unfortunate purchaser.

Mr. Clegg suggested that the defendant should recoup his client the loss he had sustained. If that were done he would not press for a penalty.

Mr. Muir Wilson said his client was quite willing to do that. He would be more careful in the future. The amount he would pay would be £3 2s. 6d. It would be a serious thing to his client to have a conviction against him.

The Stipendiary was willing to agree to the arrangement. There was, however, the public side of the matter to be considered. Jewellers should be careful and cautious, and not impose on the public, however innocently. It was one thing to do so deliberately and wilfully, and another to do it carelessly and negligently. This case coming before the court would no doubt make people more careful. This being the first case coming before him, he would dismiss the summons on the defendant paying all the expenses.

JEWELLERY ROBBERIES IN BIRMINGHAM.

WILLIAM WALLIS (43), caretaker, of 7, Northampton Street, was charged last month with stealing a quantity of scrap gold and silver, one registered parcel containing gold brooches, bangles, lockets, etc., one pair of scissors, one gold scarf-pin, a number of silver brooch-pins, and one gold brooch, from the warehouse of Mr. J. M. Banks, Northampton Street. The value of the property was placed at about £15.—Mary Ann Wallis (46), wife of the first-named prisoner, was charged with stealing seventeen spoons, of various kinds, five prongs, four fawns' feet, five pearl paper-knife blades, from the warehouse of Messrs. Levi and Salaman, of Newhall-street. Dr. Showell Rogers prosecuted in the case of the male prisoner on behalf of the Jewellers' and Silversmiths' Association, and in opening the case said prisoner's employment was wrongly represented as being entirely that of a caretaker. He had, however, to a large extent taken care of himself. In reality he was a handy man about the premises, and was often engaged in melting. He was suspected of the robbery, and when taxed by the police denied that he had in his box at home anything which did not belong to him. After some trouble his box was searched, and at the bottom, covered with clothing, was the parcel containing the jewellery, which had been sent to his employers. The detectives also found a quantity of gold and silver scrap. Prisoner made several excuses, one of them being that he found the parcel in the waste-paper basket, and intended to give it up when it was asked for. Evidence was called in support of the charges, and the Stipendiary sent the accused for trial to the sessions, and refused bail.—The charges against Mrs. Wallis were heard in the Second Court, before Messrs. S. Timmins and G. Marris. The evidence showed that when the house was searched by Police constables Taylor and Moxon the articles were found. The woman was employed by Messrs. Levi and Salaman as charwoman, and it was proved that she had stolen them while engaged on the premises. A fine of 40s. and costs was imposed.

THE POSTAGE OF JEWELLERY.

A FIRM of bullion-dealers having written to the Postmaster General on the subject of the loss of some parcels of bullion, have received a reply stating that the department will be glad of publicity being given to the regulations, particularly to the following points:—

1. That watches, money, and jewellery, whether sent in insured or uninsured *parcels*, are excluded from compensation under the Parcel Post Rules.

2. That definitions of these three terms are given in the "Post Office Guide"; and that "Jewellery," it may be specially remarked, is defined to include gold and silver plate and bullion.

3. That light packets containing watches or money or jewellery can be sent by *Registered Letter Post* as cheaply as by Insured Parcel Post, and that if so sent compensation is payable for loss or damage under the regulations of the Inland Registration and Insurance system.

4. That the machinery of the Inland Parcel Post is not adapted to the transmission of articles of small bulk and great value.

PRECIOUS STONES.

By George F. Kunz.

(*Concluded from p.* 88.)

THE families with iridescent interior layers are the following: among the cephalopods, the nautilus and the ammonites, the latter wholly fossil. In both these groups the removal of the outer layers of the shell reveals the splendid pearly surface beneath. Modern nautilus shells are often "cleaned" with dilute acid to fit them for use as ornaments, and frequently this is done partially, elaborate patterns being formed by leaving parts of the white middle layers to contrast with the pearly ground. Among the fossil ammonites, the same effect is produced, very often naturally by decay of the outer layers; and no artificial pearl work can equal the richness of colour displayed by many of these specimens.

The subdued beauty and purity of the pearl now renders it even more popular than before, and it never commanded such high prices as during the past ten years. At present no jewel is considered in quieter or better taste than the pearl. This unusual demand has had the effect of greatly stimulating the search for them, especially on the west coast of Australia, Thursday Island, the Sooloo Archipelago, in Ceylon and the Persian Gulf, and also along the coast of Lower California.

The demand has included pearls of all colours except the inferior yellow. The fine black pearls from Lower California have been in great request, single ones bringing as much as 8,000 dols. And with these black pearls are found many beautiful grey and greyish-brown ones. The different fisheries of the world produce fully 1,000,000 dols. worth annually, of which our Lower California fisheries have yielded fully one-sixth. Kentucky, Tennessee, and Texas have given us over 10,000 dols. worth of pearls per annum, derived from the fresh water unios, and during 1889 at least 30,000 dols. worth of pearls were found in one district in Wisconsin, many of which were remarkable for their brilliant and curious tints, red, purple, and metallic.

The subject of artificial gems is at present of considerable interest, as furnishing an example of the surprises which the modern science of chemistry is constantly giving us. In 1886, there appeared in the Paris market certain stones which had been offered for sale by a Geneva house as rubies from a new locality; subsequently it was said that they were obtained by the fusion of a large number of small rubies, worth at most but a few dollars a carat, into one gem worth many times that amount. An examination proved that they were not the product of fusion, which would have resulted in the formation of a substance lower in specific gravity and less hard than a ruby; but that they were artificial stones, and had been formed by heat, not from rubies, but evidently from passing an aluminate of lead in connection with silica into a silicious crucible, the silica uniting with the lead to form a lead silicate, and liberating the alumina, which crystallized in the form of corundum. The difference between these stones and the true ruby was very apparent, owing to the presence of a large number of spherical bubbles, occasionally some pear-shaped, and a stringy internal structure, showing how the bubbles had moved. Mr. Ebelmann, at Sèvres, over 40 years ago, and now M. Fremy, of Paris, after 15 years' experimenting, has, with the assistance of M. Verneuil, succeeded in obtaining large numbers of beautiful crystals, one obtained after many experiments, and conditioned largely upon the fire, which regulates chemical action. Although the colour is excellent, the crystals do not exceed one-twenty-fifth to one-fiftieth of an inch in diameter.

In *Nature*, vol. xxi., January 1, 1880, p. 203, Mr MacTear, of the St. Rollo Works, Glasgow, published some investigations, by which he claimed he had produced artificial diamonds. Professor N. S. Maskelyne proved this claim to be unfounded, as has been the case with other investigators. In 1880 Mr. J. Ballantine Hannay read before the Royal Society a paper in which he claimed to have successfully produced artificial diamonds after eighty dangerous experiments. He had obtained the results, he said, by tightly sealing steel and iron tubes or coils, about four inches thick (some of which were made by boring out a solid block of iron), containing 10 per cent. bone-oil and 90 per cent. paraffine spirit.* After subjecting these tubes to intense heat for some hours he produced fourteen milligrammes of residue, part of which he called diamond. The substance exhibited before the society was undoubtedly diamond, being pronounced such by Professors Maskelyne, Roscoe, Stokes, and others; but none of it can be seen to-day in the British Museum cabinet, and as the specimens were of a fragmentary character, and not crystals, it is believed by many that, although they were diamonds, they were never made by Mr. Hannay.

Paris Exposition.

Fifty-five nations were represented at the Paris Exposition, and nearly every one of these had a governmental exhibit of the minerals of its country, besides in many cases collective exhibits of private collectors. Some of these exhibits were very remarkable, and had they been assembled in one building, as was the machinery in Machinery Hall, the mineralogical and metallurgical and precious stones exhibits would have been impressive ones. As it was, they were scattered over such immense distances that important ones were often overlooked.

Class 41, which included minerals, or, in other words, the products of mining and the materials obtained therefrom, contained over 1,800 distinct exhibits. A collection of gold shown in this class by a French engineer, in the French section, was perhaps the finest ever formed. It contained many remarkable specimens of gold from California; a wire of gold six inches long from Colorado; gold amalgam, nuggets, and gold-dust. The 300 specimens represented almost every gold-producing country in the world, and the collection was the result of over thirty years' work.

In the centre of the French Jewellery Section, Class 37, was exhibited the Imperial or Victoria diamond, already described; at one of the four central corners, by Bapst and Falize, the historic Sancy diamond, weighing forty-one carats; opposite a necklace composed of pink, blue, yellow, brown, black, and other coloured diamonds. This section contained an immense number of fine and curious diamonds, rubies, emeralds, and other precious stones, as well as several interesting lapidary exhibits, and nearly fifty exhibits of imitation stones of all kinds, imitation pearls, etc. A carved diamond turtle, a fly, and some curiously-drilled diamonds were of more than ordinary interest.

In Class 18, Section of Decorative Arts, were some fine chandeliers of rock crystal, valued at 7,000 dols. each; pedestals covered with slabs of agate amethyst from Lorraine, valued at over 2,000 dols. a pair; rock-crystal spheres (not perfect, however) up to six and one-half inches in diameter, and other magnificent examples of lapidarian work in agate, jasper, rhodonite, and jade.

From the Pyrenees and from Belgium magnificent collections of finely-coloured marbles were shown.

The Russian exhibit contained a case of nephrite and graphite, exposed by M. Alibert, similar to the collections shown at the Expositions of 1867 and 1878, which were presented by M. Alibert to the Ecole des Mines, the Musée Naturel, and the Conservatoire des Arts et Métiers. Jade was formerly obtained by M. Alibert in his graphite mines in Siberia, discovered in 1847 at Botovgal in the Sian Mountains, near the Chinese frontier. One mass of jade from these mines weighed 1,300 pounds, another 1,100, and several of the specimens in the case weighed several hundred pounds each.

Of even more interest were the polished, transparent sections of boulders of jade, sawed by M. Alibert from blocks found by himself; these were beautifully polished on both sides, were less than one-eighth inch in thickness, and some measured 3 feet in length and over 18 inches in width, forming beautiful panes for windows, having a delicate shading and a brilliancy not to be obtained in any other material. With this was a large series of graphite, curiously carved into ornaments, to show the perfect homogeneity and fine grain of the graphite from his mines.

The collection of Mr. Woerfel contained a large number of the table tops, mantels, vases and other ornaments of malachite, lapis-lazuli, rhodonite, labrador spar, and other stones characteristically Russian, which have been used extensively in that country in the decoration of churches and palaces, and have been frequently made use of as imperial gifts by the Czar, as the royal palaces throughout Europe will testify.

From the Ural Mountains came an exhibit of a magnificent series of blue, white, and cherry-coloured topaz crystals, some of the largest of which weighed one pound, and some smaller ones, several inches in length, were absolutely transparent; a doubly terminated crystal of beryl that weighed one pound eight ounces, but was not entirely free from internal fractures; small crystals of alexandrite; some magnificent purple amethysts, unrivalled for depth and richness of colour; *chrome tourmaline* in crystals, from one to three inches in length, and other varieties of well-known Russian minerals.

In the Hungarian Section was a very interesting case of opals, and also opal in the trachyta matrix, from the famous Hungarian mines at Czernowitza, which have been worked for over 300 years.

In the Roumanian Section was exhibited a very interesting series of ambers, strikingly like those from Catania, Sicily, in form and in colour; the different colours shown were light yellow, dark yellow, cloudy white, opaque white, black, brown, bluish green, dark opalescent blue, opaque red, of which Prince Bibesco loaned one of the finest known necklaces. This amber was all found in the department of Buzeo and in these places: Bisca-rusilei, Bisca-Chisjdului, Coltzia, Valea-boului and Bodila. The Roumanian amber is exceedingly rare, and is very highly valued.

At the Exposition there were three exhibits at which the branches of cutting and polishing were carried on. At the Holland pavilion the display made by Boas Frères, of Amsterdam, had a number of polishing wheels, the motive power of which was steam, as well as a machine reconstructed, showing the manner in which man-power was utilised during the eighteenth century. With this exhibit there was a large series illustrating the various forms of cutting the brilliant, rose and table, as well as all the forms of rough diamonds, such as cleavages, splints, those for glass-cutting, and shaped for specially adapted tools.

Two Belgians exhibited diamonds—one perfect yellow octahedral diamond, weighing 300 carats; a diamond cross, cut from a single stone (which is not unique, as claimed by the exhibitor, for such a stone was contained in the Hope Collection and was illustrated in the Hope Catalogue of 1839); some fanciful and curiously-cut brilliants; a small sword cut out of three diamonds, and the name of the exhibitor in table diamonds, 17 of which were nearly an inch in length.

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* [A part of the charge was an alkali metal.—Ed.]

In the main aisle, Contermans, of Antwerp, had an exhibit with the polishing wheels, an exhibit of the diamonds in the altered kimberlite, and a black diamond, weighing thirty carats, which it was reported had been purchased by the Shah, but of which in reality he only inquired the price.

Greece made a magnificent display from the famous mines at Laurium, which were worked before the beginning of the Christian era, as is proved beyond doubt by the fact that, in the collection in the Assyrian Gallery, in the Louvre, the writer saw necklaces made of beads of gold and carnelian, and also, to his surprise, of the blue and white-veined beads of so-called calamine (Smithsonite), from Laurium. Masses of this mineral were exhibited that must have weighed at least a ton each, and in the general exhibit were magnificent botryoidal specimens, from this locality, of the blue, green and yellow calamine, which rivalled anything found elsewhere.

In the Persian Section were shown masses of lapis-lazuli, weighing several pounds each, and a large series of cut and engraved Persian turquoises.

In the Madagascar Pavilion was exhibited a series of gravels containing sapphire, zircon and tourmaline.

A collection of precious and ornamental stones of North America, as well as a collection of foreign precious stones, was displayed by Messrs. Tiffany and Co., in the American Section. The former collection was contained in a circular case nine feet in diameter, on a platform erected at the intersection of the four aisles of the American Section. This collection was formed for the purpose of illustrating the occurrences of the precious and ornamental stones in North America, and contained many of the finest examples that have been found, some unique, others entirely new. This collection was the result of purchase, completed by generous loans from some of our prominent mineralogists, and was an object of interest to the many visitors of the Exposition.

One of the features of the jewellery exhibit was the utilisation of American stones and pearls in jewellery, notably tourmalines, beryls (yellow, green, and blue), rock crystals for vials and boxes, and pearls from the unios in a large variety of objects—the motive, as well as the materials employed, being American in character.

Among the more important things in this collection were some small diamonds from California; a series of the original crystals of sapphires, collected by Col. C. W. Jenks when he opened the Jenks Mine in Franklin, Macon County, N.C.—among them the first sapphire found in the United States; a ruby of fair colour, some American crystals and cut topaz from Cheyenne Mountain, Col.; one of the largest crystals of emerald from Alexander County, N. C., loaned by Mr. Bement; the cut aquamarine, weighing 133 25-32 carats, from Stoneham, Me.; thirteen cut aquamarines from Mt. Antero, Col., found at an altitude of 14,000 feet above the sea; a number of cut spessatite garnets, one of which weighed 96 1-16 carats, from Amelia Court House, Va.; a series of coloured tourmalines, both cut and crystal form, from Mt. Mica and from Auburn, Me.; a collection of pearls and the shells in which they are found on the shores and in the rivers and brooks of North America

Some notable things in the Tiffany foreign collection were a series of twenty-four fancy coloured sapphires, weighing from two to twenty carats, and showing every colour of the spectrum; some fine alexandrites, chrysoberyls, and zircons from Ceylon; crystals and cut euclase from Brazil and Siberia, and a number of interesting precious and ornamental stones.

The Brazilian Commission exhibited a very interesting collection of the precious stones of Brazil, especially the diamond and its associations, but not such fine examples as those shown at the Centennial Exposition. Many of the fine specimens in this exhibit were loaned by European collectors and dealers. Among those of chief interest were a dish of yellow topaz crystals, several of which are over two inches in length and one inch in diameter; magnificent crystals of green tourmaline, from two and a half to four inches long; fragments of crystals of amethyst, two and three inches in diameter; diamond crystals, from less than the size of a pin-head up to six carats. There was also a collection of minerals associated with the diamond in Brazil, consisting of rutile, zircon, anatase, lazulite, and a set in miniature of the implements and bowls used in washing and in digging and working the river gravels. This entire case is the production of the province of Minas. Of special interest are the "Sables Diamantifères," as the conglomerate rock containing the diamond is called, and also the masses of klaprothine, identical with the lazulite of Georgia, and the series of minerals of the gravels which were identified by Prof. Gorceix, of the School of Mines at Oura Preta, among which were pyrope, cyanite, pyrite, fibrolite, xenotime, anatase, hematite, limonite, tourmaline, monazite, baierite (titanic iron), and itacolumite rock. These are especially interesting, since they have all been found in North Carolina and Georgia. The Vicountess de Cavalacantie exhibited a case of jewels from the Province of Minas, among which were some fine amethysts, topazes, aquamarines, citrines, and five beautiful examples of the chrysoberyl or chrysolite jewellery, worn and made in the latter part of the eighteenth century.

Among a remarkable series of ornaments made and worn by the Botocudo Indians of Brazil were some made of materials of marked mineralogical interest. The most notable were lip ornaments, one a rich Amazon-green feldspar in the form of a disk, 2½ inches in diameter and about 1 inch thick, with projecting shoulders for retaining the ornament in the lip. The great breadth of this would suggest difficulty in the use of a pipe; but Dr. Ladislaus Netto, Director of the National Museum, Rio de Janeiro, exhibited a pipe used by the Indians, adapted to overcome this difficulty. The stem was flat, and over two inches in diameter, and quite thin, so that it could be laid on the projecting lip ornament and easily held in the mouth. Another lip ornament was 3 in. long and 1½ in. wide; another, an oval disk, 3½ in. long and 1 in. thick, of beryl; a flat, sole-like fish, 2 in. long and 1 in. wide, made of a material said to be jade; a circular shaft of rock crystal, 5 in. long, with two projecting ends; two spear-heads, 3 in. and 4 in. long, and some ear ornaments, all made of transparent rock crystal.

In the Bolivian Pavilion was also a series of specimens of lapis-lazuli, from the Andes, to which were given four distinct names, *i.e.*, lapis agatado, lapis-lazuli, lapis maclado, lapis laminosa. The most important exhibit was in the United Diamond Mines building, in which every process connected with the mining and cutting of the diamond could be seen under one roof.

First the large sacks of earth, of which 1,000 were washed at the Exposition, were thrown on to a screen which sifted the material into a large washing-pan, or "compound," as it is called, about 15 feet in diameter. In this compound all the soft mud, light particles of shale, kimberlite, quartz, calcite, and other minerals whose specific gravity is less than that of the diamond, were floated out, and in the centre the diamond, garnet pyroxene, and heavier minerals were concentrated. These concentrates were then carefully sorted, the garnets and the diamonds being the only ones of value.

In connection with this exhibit were shown models, or rather reproductions, made of earth, and small models, exact duplicates of the machinery and the tunnel systems used at the mines.

The De Beers Consolidated Mines exhibited, in a large central case, 5,138 carats of rough diamonds. This case was securely covered with an iron cage, like a parrot cage in form, exposed by the maker of the cage in which the Kohinoor diamond was exhibited at the London Exposition of 1851. In this exhibit was a cut diamond, the largest brilliant in the world, weighing 228½ carats, which in the rough had weighed over 400 carats; one large octahedral crystal weighing 306 carats; and a collection of 983 carats of fancy-coloured crystals of white, mauve, pink, orange, yellow, brown, and black; also a large number of distorted and curious crystals. The Belfontein Mine exhibited 11,227 carats of rough diamonds, and the Griqualand West Diamond Mining Company a parcel of 45,003 carats.

At the opening of the Exposition the diamonds were valued at twenty-two shillings a carat, and at its close at thirty-eight shillings, so great has been the advance in the price of rough diamonds. One thousand sacks of diamond earth were washed at the Exposition, and the average amount of diamond found was one and one-half carat to a load of earth.

In connection with this exhibit was the cutting of diamonds, carried on by M. Roulina, who reintroduced diamond-cutting in France, and is one of the few men abroad who has utilised a machine for the process. This machine, however, is very primitive in comparison with the more perfect one invented fifteen years ago in the United States, and in use here since. There were also diamond-piercing machines in operation; these required from twenty to thirty days to pierce a diamond of about two millimetres in thickness, the drills revolving at the rate of 14,000 revolutions a minute.

Not without interest was a diamond which had been a beautiful white stone of about nine carats, but which was shattered into fragments while undergoing the polishing process on the wheel.

On Phosphorescent Diamonds.

On November 4th, I was enabled to make an experiment, through the courtesy of Dr. E. Mascart, membre de l'Institut, Director of the Central Observatory of Paris, and Prof. B. Abdank, electrician, member of the jury, who arranged a dark room, in which a collection of over one hundred and fifty diamonds was placed. In one side of the wall was inserted a lens, and outside the room was suspended a new alternating arc lamp of the Thomson-Houston system. The lens, which served the purpose of concentrating the light, was covered with a violet-covered glass, so that only the ultra-violet rays were thrown on the diamonds, which numbered over 150 stones. Among these were several old Indian, Brazilian, and Cape stones, and from the South Africa River diggings. Of the entire collection, only three diamonds were phosphorescent. One, a Brazilian stone of one and five-eighths carats, possessed this quality in a remarkable degree; an old Brazilian stone of three carats also showed the same property; all the others assumed a beautiful violet tint. The two stones whose phosphorescence was most marked were perfectly transparent white stones, one with a bluish tinge; they assumed the milky white colour of the variety peculiar to the Bagogom mines of Minas Garaes, of which only a few are annually found. The phosphorescence exhibited by these stones was extremely beautiful, it remained visible when a metallic cap was put over the lens, gradually losing its intensity, however, for fifteen minutes after the exposure. All the other stones collected were invisible in the dark. Pure white light was also used, resulting in a less beautiful experiment, though the phosphorescence was quite as apparent.

This test fully demonstrated the fact that some diamonds, though not all, possess the power of absorbing light, and emitting it in the dark; and in those possessing it, it is found in different degrees of intensity.

An experiment was also made to test perfection of cutting. Light from a common arc lamp was concentrated on the table of stone, from the facets of which spectra were reflected on the wall, the regularity of which depended upon the perfection of the cutting.

Dr. Crookes says: "Next to the diamond, alumina in the form of ruby is, perhaps, the most strikingly phosphorescent stone he had examined. It glows with a rich full red, and a remarkable feature is that it is of little consequence what degree of colour the earth or stone possesses naturally, the colour of the phosphorescence is nearly the same in all cases - chemically precipitated amorphous alumina, rubies of a pale reddish yellow and gems of the prized pigeon's-blood colour growing alike in the vacuum, thus corroborating E. Becquerel's results on the action of light on alumina and its compounds in the phosphorescope. The appearance of the alumina glow in the spectroscope is remarkable. There is a faint, continuous spectrum ending in the red somewhere near the line B; then a black space, and next an intensely brilliant and sharp red line, to which nearly the whole of the intensity of the coloured glow is due, this suggesting that the colours in corundum gems may only be a change in the alumina, and not a definite colouring matter."

Considerable attention has been given to the alleged power of diamonds to emit light in absolute darkness. Dr. William Crookes, in his experiments on the phosphorescence of diamonds of various colours, found that those glowing pale blue had the longest residual glow. Next came the yellow. He was unable to detect any residual glow in diamonds of a reddish colour. A large diamond of greenish hue, very phosphorescent, shone almost as brightly in the phosphorescope as out of it.

To the numerous allusions that have been made in the press to the exhibit of artificial stones at the Paris Exposition, is probably due the popular error that confounds the word "artificial" with the word "imitation." Not a single artificial diamond, ruby, or sapphire was shown; but there were some hundreds of exhibits of imitation stones from France, Austria, Hungary, and Germany. The term "artificial" can be correctly applied only to a gem that is artificially made; whereas the term "imitation" covers all glass and such other productions.

TESTING EMERALDS.

CAPT. BATTERSBY gives in a contemporary the following directions for testing an emerald: "It is the easiest thing possible to test your emerald. The first and easiest test is to touch it with your tongue, when a real stone feels intensely cold, and all paste imitations warm, or but slightly cool. If you try a stone and a paste once, you will never mistake one for the other again. Next you can take a file, and try if you can file the stone. If you can, it is paste. No stone that I know of, except some specimens of Bobrowska garnets, comes up to the intense green of a good emerald; but if you wish to try further experiments, get a pair of medicine scales, and take the specific gravity, which is easily done. An emerald's will lie between 2·6 and 2·75. It should scratch quartz, and, by the way, you may try this first of all, if you have a quartz crystal, as it will set the question of genuineness at rest at once. I have not mentioned the green corundum, or Oriental emerald, as that is so rare as to be out of the question. One thing more your stone might be, namely, a doublet. I have seen some fine emerald doublets. Steep it in chloroform, and it will resolve itself into its constituent parts if so. In the dichroiscope the emerald shows two colours, a yellowish and bluish green. But briefly, if your stone scratches quartz, and is a rich grass-green, it is either an emerald or green corundum, and the chances are about 10,000 to 1 in favour of the former."

APPLICATIONS FOR LETTERS PATENT.

This List has been specially compiled for the Watchmaker, Jeweller, and Silversmith *by* Messrs. W. P. Thompson and Boult, of 323, High Holborn, London, W.C.; 6, Lord Street, Liverpool; 6, Bank Street, Manchester; and 63, Long Row West, Nottingham.

15,018.—A. M. Lane, 323, High Holborn, London, for "Alarm-striking mechanisms" (complete specification). Dated September 23rd.

15,031.—W. F. Gentry, Stratford New Town, for "The temperature adjustment of high-class watches, viz., 'The acme non-magnetisable compensation balance.'" Dated September 23rd, 1890.

15,059.—F. Chapman, London, for "Improvements in gold-saving machines" (a communication from G. Massey, Australia), (complete specification). Dated September 23rd, 1890.

15,071.—C. E. Skinner and H. A. Morgan, Birmingham, for "Improvements in or connected with jewellery." Dated September 24th, 1890.

15,083.—F. G. Edwards, London, for "Improvements in sleeve-links." Dated September 24th, 1890.

15,180.—S. Leighton, 6, Lord Street, Liverpool, for "Improvements in studs, pedigree plates for sheep, solitaires, sleeve-links, and the like." Dated September 25th, 1890.

15,182.—William P. Thompson, 6, Lord Street, Liverpool, for "Improvements in or relating to time-recorders, applicable for registering the time at which an *employé* enters his place of employment" (a communication from Willard Le G. Bundy, U.S.) Dated September 25th, 1890.

15,361.—J. Jacobi, 6, Lord Street, Liverpool, for "Improvements in or relating to shirt studs, sleeve-links, fasteners for earrings, bracelets, jewellery, or the like." Dated September 29th, 1890.

15,582.—J. Spence, London, for "Improvements in manufacture of aluminium." Dated October 2nd, 1890.

15,586.—L. M. McIntosh, Manchester, for "An improved sun watch or time-teller." Dated October 2nd, 1890.

15,644.—William Brown, London, for "Improvements in electric clock-circuit-closing apparatus." Dated October 2nd, 1890.

15,651.—Koch and Co., London, for "Improvements in watch and jewellery tickets." Dated October 3rd, 1890.

15,773.—J. Cordingley and A. Hirst, London, for "Improvements in treadles for watchmakers' and other small lathes; also applicable for sewing machines." Dated October 6th, 1890.

15,836.—H. Lambe, Ealing, for "A completed pivoted watch-cylinder." Dated October 7th, 1890.

15,912.—F. A. Walton, Birmingham, for "Improvements in or connected with solitaires, studs, and other fastenings for wearing apparel." Dated October 8th, 1890.

15,979.—A. E. Evans, London, for "A mechanical contrivance whereby watches can be used for another purpose besides that of indicating the time." Dated October 8th, 1890.

16,124.—D. Fairgrieve, London, for "Improvements in electric clocks" (complete specification). Dated October 10th, 1890.

16,125.—J. Wyss, London, for "An improved balance-wheel for watches and the like." Dated October 10th, 1890.

16,127.—J. Berthona, London, for "Improvements in brooches" (complete specification). Dated October 10th, 1890.

16,269.—R. Haddan, a communication from R. H. Pogue, Gibraltar, for "Improvements relating to the illuminating of watches" Dated October 13th, 1890.

16,361.—W. Lister, Birmingham, for "Extending or lengthening of the neck or stem of a shirt stud." Dated October 14th, 1890.

16,439.—J. A. Killin, Guernsey, for "A new solitaire, shirt stud, and collar stud." Dated October 16th, 1890.

16,468.—C. D. Abel, a communication from K. A. Mayrhofer, Germany, for "Apparatus for effecting the automatic driving, regulating, and winding up of clocks" (complete specification). Dated October 16th, 1890.

Gazette.

The Late Mr. G. H. Gowland's Estate.

In the Durham Court of Chancery Mr. G. W. S. Goodger, solicitor, applied to the Registrar of the Durham Court of Chancery (Mr. A. O. Smith) on behalf of the mortgagees of premises in High-street, Sunderland, in which Messrs. Gowland for many years carried on the business of jewellers and silversmiths. Mr. Goodger said the estate of the late G. H. Gowland was now being administered under the direction of the Palatine Court, and the receiver appointed by the court was in possession of the mortgaged property which his clients desired to sell, and he asked that the receiver should be ordered to give up possession to them.

Mr. W. D. Mann, solicitor, Sunderland, who represented the receiver, said the facts were not in dispute; but he repudiated the mortgagees' right to the rent which, by the summons, they claimed.

The Registrar said the right of a mortgagee to the mortgaged hereditaments was clearly paramount to that of a receiver, and if the present mortgagees had been in possession when the receiver was appointed, their position would have remained unaffected thereby. It was otherwise, however, if the mortgagee was not in possession at the time of the receiver's appointment, and the court would not suffer a mortgagee to oust a receiver without its sanction. A receiver was the officer of the court, and his possession was the possession of the court, and when once he had taken such possession, no one, however good his title might be, was allowed to dispossess him without the authority of the court. If a mortgagee had a better right than the receiver to possession of the mortgaged property, his course was either to apply for leave to proceed in the enforcement of his legal rights, notwithstanding the possession of the receiver, or to come into court and be examined *pro interesse sus* (Angel *v.* Smith, 9 Vesey 338). It was not disputed that the applicants were legal mortgagees of the premises in question, and not having exercised their right of taking possession under the powers of their mortgage deed they sought the aid of the court to which they were entitled in the enforcement of their legal remedies. There would be an order for the discharge of the receiver so far as the mortgaged premises were concerned. The costs of the application on both sides were allowed.

BUSINESS DIFFICULTIES AT PRESCOT.

AT the Liverpool Bankruptcy Court, on October 16th, before Mr. Registrar Bellringer, Thomas F. Williams, who had been in business as a watch material manufacturer at Prescot, appeared on his public examination, with a statement of affairs which showed assets £305, less £16 due to preferential creditors, against liabilities of £913. The Official Receiver conducted the examination. The debtor stated that he had been trading as "F. Williams and Co.," but was, in fact, alone in the business. In 1883 he and a brother joined their father, who carried on business as a watch material dealer in Carnarvonshire. In December, 1885, the father retired from the business on an annuity of £100 a year, of which £80 was to be continued to his widow in the event of his decease. A little later the brother got married, and left the business, taking out £100, and bankrupt assumed the liability under the annuity. He came to Prescot in October, 1888, his object being to manufacture his materials instead of purchasing them. In the August following it was arranged that the annuity should be commuted by an immediate payment of £100, an assignment of book debts to the amount of £250, and a further payment of £350 in sums of £50 every four months. He paid two instalments, but on his failing to pay the third, his father sued him, obtained judgment, and then seized his furniture, upon which he filed his petition in bankruptcy. At the commencement of the current year he estimated that after allowing for his liability under the annuity he was £200 to the good. Since then, however, he had had several heavy losses, including one of over £100 through the evictions in Tipperary. Nearly all the men in the trade in the main street there had been evicted, and their businesses, and in some cases their stock also, had been destroyed. Since the beginning of the year he had only cleared £95 of profit. —An adjournment was taken for a fortnight.

HEAVY FAILURE AT BIRMINGHAM.

A MEETING of the creditors of Harris Davis Brenholz, jewellers' factor, carrying on business at 29, Summer Hill Terrace, was held last month at the offices at the Official Receiver (Mr. L. Sharp), Colmore Row.

Mr. E. Jaques appeared for the petitioning creditor, and Mr. Tanner for the debtor.

The statement of affairs represented that the gross liabilities were £6,034 15s. 11d.; liabilities expected to rank, £5,012 15s. 2d.; and the assets, £2,098 18s. 7d.

From the Official Receiver's observations on the case it appeared that the debtor commenced business in 1862 at Liverpool, without capital. He was adjudicated a bankrupt in 1865. In 1869 he came to Birmingham, trading in partnership with Mr. Suckerladen, his father-in-law. In 1878 his partner died, and in the early part of 1879 the debtor again failed. Since then he has traded at Belgrave Road, Claremont Road, Soho Hill, and Summer Hill Terrace. He removed to the latter premises in 1884. On 28th July of this year a deed of composition was executed. Some of the creditors accepted a composition of 10s., but as they were not unanimous the present proceedings were instituted. The failure is attributed to heavy trade expenses and losses in trade.

Mr. Tanner said the assets were mainly made up of £1,570 10s. 6d. stock-in-trade, and if the case went into bankruptcy and these goods had to be sold at a forced sale, they would be deteriorated something like 50 per cent. Deducting the costs, there would be left for creditors between three and four shillings. The debtor offered to pay a composition of 7s. in the pound. The assets amounted to £2,098, from which would have to be taken £200 for duties, stamps, and other costs, leaving £1,898 available, and that showed 7s. in the pound and a surplus of £148. The stock, having been locked up since the early part of July, had deteriorated, and the debtor ought to be allowed in respect to it a consideration to the extent of 25 per cent. Twenty-five per cent. of the value of the stock would be £370. The debtor proposed to pay the composition thus—2s. 6d. in four months, 2s. in eight months, and 2s. 6d. in twelve months, the last instalment to be secured. By this arrangement they would get double as much as if the matter went into bankruptcy.

Mr. Poppleton asked the Official Receiver whether he thought the proposition was one they ought to entertain.

Mr. Sharp said it might be as far as pounds, shillings, and pence were concerned, but they had a debtor who had failed before, and the judge had considered his conduct such that he suspended his discharge for six months.

Mr. Porter said, from figures that had been obtained by Mr. Allen Edwards from the books of the debtor, in January he bought to the extent of £799 0s. 3d., and his sales in the same month were £393 18s. 9d.; in February his purchases were £188 15s. 10d., and his sales £259 7s. 11d.; in March his purchases were £441 1s. 1d., and his sales £352 2s. 2d.; and in April his purchases amounted to £2,260 8s. 5d., while his sales fell to £214 15s. 9d. It was not long after this he called his creditors together.

Debtor stated that up till the 4th July, when the bank stopped his credit and refused to advise his bills, he had no knowledge that he was insolvent.

Mr. Jaques spoke in favour of the composition, and asked what they were to get by bankruptcy. He had heard of a threatened prosecution under the Fraudulent Debtors' Act, but considerably more than four months had elapsed since the date of the transaction which had been considered questionable.

The Official Receiver remarked that that might be an unquestionable objection, but it did not improve the conduct of the debtor. He could not give the meeting much encouragement that if they passed a resolution in favour of the composition the Court would approve it. There was nothing to justify him buying such a large stock in April. The whole trade would simply go to seed if conduct of the sort was not dealt with. It was a premium upon reckless trading.

Mr. Hyde said he had spoken to many persons in the trade on the subject, and he was thoroughly surprised at the many proofs which had been put in in favour of the composition.

Mr. Best (vice-chairman of the Jewellers' Association) thought that men like the debtor ought not to be dealt with in any way. If they had any dealings with men of his calibre it simply meant more money lost in the future.

The Official Receiver: That is my view.

As the composition proposal could not be carried, the meeting resolved upon adjudication, and Mr. Allen Edwards was appointed trustee.

MRS. SARAH ANTILL, of 69, Union-street, Stonehouse, near Plymouth, watchmaker and jeweller, finding herself unable to meet her engagements, a meeting of her creditors was held in Birmingham, when a statement of affairs, prepared by Messrs. Poppleton and Appleby, chartered accountants, Birmingham, was submitted, showing unsecured liabilities amounting to £1,658 5s. 6d., and ssets, after deducting preferential claims, amounting to £653 12s. 6d. After some discussion it was decided to wind the estate up under a deed of assignment, and a resolution was passed appointing Mr. George G. Poppleton, C.A., general manager of the Wholesale Traders' Association, 26, Corporation-street, Birmingham, trustee under the deed of assignment for the benefit of the creditors generally.

DEEDS OF ARRANGEMENT.

Yorks.

Whittingham, John William, 1 and 3, Swine Market, Halifax, jeweller and tobacconist. Trustee, George North, Crown Street, Halifax, accountant. Unsecured Liabilities, £989 3s. 7d.; Estimated Net Assets, £420. Deed of Composition dated September 17, 1890; filed September 23, 1890.

Creditors.		£	s.	d.
Brooke, Gerald	Batley	15	0	0
Coffe, John, and Son	Birmingham	25	0	0
Cohen, J., and Son	,,	206	0	0
Griffiths, William	,,	135	0	0
Sloane and Carter	,,	103	0	0
Marlow, C. J. H....	Coventry	49	0	0
Appleyard, Thomas	Halifax	15	0	0
Bottomley, E.	,,	10	0	0
Hutchinson, W.	,,	29	0	0
North, George	,,	15	0	0
Parish, James	,,	70	0	0
Brash, Isaac	Leeds	16	0	0
Harrison and Co....	,,	15	0	0
Widmer, Gabriel...	Liverpool	43	0	0
Marks, A. and G....	Manchester	64	0	0
Myers, Joseph	,,	20	0	0
Shoeps Bros.	,,	26	0	0
Mark, Willis, and Son	Sheffield	23	0	0

Lincs.

Fromant, Henry Pryor, 31, Hall Place, Spalding, jeweller. Trustee, Robert Peters, Cambridge, C.A. Unsecured Liabilities, £155. Estimated Net Assets, £150. Deed of Composition dated October 10, 1890; filed October 16, 1890.

Creditors.		£	s.	d.
Harris, H., and Co.	Birmingham	15	19	6
Constantine and Floyd	,,	19	10	11
Pennington, C. W.	Spalding	40	0	0

Somerset.

Porter, Philip, Silver Street, Ilminster, watchmaker and jeweller. Trustee, George G. Poppleton, 26, Corporation Street, Birmingham, C.A. Unsecured Liabilities, £252 3s. 2d. Estimated Net Assets, £70. Deed of Composition dated October 13, 1890; filed October 16, 1890.

Creditors.		£	s.	d.
Hohnes, Wm. Jas.	Birmingham	118	7	4
Platnauer Bros.	Bristol	55	0	0
Tucker, W. E.	London	50	0	0
Wilts and Dorset Bank...	Ilminster	17	13	2

(And 3 under £10.)

BANKRUPTCY PROCEEDINGS.

Kirner, Raphael, trading as Winterhalder & Co., 99, Bishopsgate Street Withont, watchmaker and jeweller. First meeting: Bankruptcy Buildings, Portugal Street, October 9th at 12. Examination: 34, Lincoln's Inn Fields, October 23rd at 12½.

Langstaffe, William, trading as William Langstaffe & Co., Ebor House, Nun Monkton, wholesale gold and silver English watch factor. Receiving Order and Adjudication: September 25th. First meeting: Official Receiver's, York, October, 9th at 11½. Examination: Guildhall, York, October 10th at 11.

Williams, Thomas Frederick, trading as F. Williams & Co., 1, West Street, Prescot, watch material dealer. Receiving Order: September 24th.

Medlen, Montague, late 246, Kentish Town Road, London, now 144, Herbert Road, Plumstead, jeweller. First meeting: 24, Railway Approach, London Bridge, S.E., October 14th at 11. Examination: Court House, Greenwich, October 7th at 1.

Mitschke, Harold, 76, Free Trade Hall, Lynn Street, and 13, South Scarborough Street, West Hartlepool, watchmaker and jeweller. Adjudication: August 13th. (Amended notice.)

Williams, Thomas Frederick, trading as F. Williams & Co., West Street, Prescot, watch materials dealer. First meeting: Official Receiver's, Liverpool, October 16th at 3. Examination: Court House, Liverpool, October 16th at 11. Adjudication: October 2nd.

Brenholz, Harris Davis, 29, Summer Hill Terrace, Birmingham, jewellers' factor. First meeting: 25, Colmore Row, Birmingham, October 20th, at 11. Examination: C.C., Birmingham, November 4th, at 2.

M'Innes, Robert, sole partner of M'Innes Bros., 8, Buchanan Street, Glasgow, watchmaker and jeweller. Trustee: John Miller, Glasgow, C.A. Commissioners: William Strang, writer, J. D. Davidson, jeweller, and James Shearer, silversmith, all Glasgow. Examination: Sheriff Guthrie's Chambers, Glasgow, October 22nd, at 11. Meeting: John Miller and J. M. Steel's, 71, Queen Street, Glasgow, C.A. November 3rd, at 12.

Barwick, Samuel, 26, High Street, and 42, Wide Bargate, Boston, watchmaker and jeweller. Receiving Order and Adjudication: October 20th.

Brenholz, Harris Davis, 29, Summer Hill Terrace, Birmingham, jewellers' factor. Adjudication, October 20th.

Small, Joseph, 75, Great King Street, Birmingham.

Hayes, James, 41, Upper Street, Islington, jeweller. Receiving Order: October 21st. Adjudication, October 23rd.

Caughie, Charles B., Argyll Arcade, Glasgow, jeweller. Meeting: John Miller and J. M. Steel's, 71, Queen Street, Glasgow, C.A. November 17th at 1, to consider trustee's discharge.

Rankin, James, Bridge Street, Glasgow, jeweller, watch and clock maker. Meeting: John Miller and J. M. Steel's, 71, Queen Street, Glasgow, C.A. November 17th at 12, to consider trustee's discharge.

NOTICES TO CREDITORS.

Myers, Joseph, 14, formerly known as 5, Duke Street, Aldgate, and 13, Salisbury Road, Dalston, wholesale optician and jeweller. First dividend of 4s. at Seear, Hasluck, and Co.'s, 17, Holborn Viaduct, E.C., October 1st and any following Wednesday.

Reyner, Fred, 24, High Street, Redcar, watchmaker and jeweller. First and final dividend of 1s. 8d. at Official Receiver's, Middlesbrough, November 4th.

Bradley, William Robert, 841 and 843, Attercliffe Road, 506, Attercliffe Common, and Worksop Road, all Sheffield, draper, jeweller, and furniture dealer. First and final dividend of 5s. 2d. at E. Mulliner's, 1, Piccadilly, Manchester, October 20th, or subsequent days, except Saturday, from 10 to 5.

Marsh, Walter Thomas, 148, High Street, Watford, watchmaker, jeweller, and machinist. Proofs for intended dividend by November 3rd. Trustee: C. Mercer, 96, Temple Chambers, Temple Avenue, London.

David, Leon, 43, Hatton Garden, and 17, Lancaster Road, West Norwood, diamond merchant. Proofs for intended dividend by November 5th. Trustee: L. Hasluck, 17, Holborn Viaduct, E C.

The Watchmaker, Jeweller and Silversmith.

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SPECIAL NOTICES.

☞ A useful and handsome **DIARY** for 1891 will be issued in connection with this Journal about the close of December.

☞ All **SUBSCRIPTIONS** will, in future, be *Payable in Advance.* Subscriptions for 1891 are now due; and the Publishers will feel indebted if these are remitted, and the necessity for application avoided.

All communications to be addressed to the Publishers—
HEYWOOD AND COMPANY, LIMITED,
68, FLEET STREET, LONDON, E.C.
Birmingham Agency—57, VYSE STREET.
Agents for the Australian Colonies—BOSCH, BARTHEL and CO., 409, George Street, Sydney.

THE MONTH PAST.

A New Jewellers' Protective Communication Society.

WHETHER the bitter lesson taught by the rascally American gang will be sufficient to convince the trade that nothing short of complete unity of action will avail to protect its members from being victimised as they have been by this gang, the exact number of which we do not at present quite know, or whether it will be content to act in little divided sections, or whether even worse, as some do, jewellers will continue to avoid giving warning to their brother traders so long as they can feel assured of their own safety—time alone will show. We have long felt the absolute necessity for concerted action in this matter, by means of which requisite warnings could be immediately communicated. In these days of telephone and telegraph nothing could be easier; each subscriber could be put in telephonic communication with the other, and when anyone was favoured with a visit from a suspicious personage, or when he lost any property, the fact could be promptly notified all round. A few months ago, a little German Jew, about 5 ft. tall, and with features easily describable, entered one of our City houses and asked to look at diamond pins; while he was turning them over the assistant noticed him pass one into the middle of his hand, and immediately taxed him with the act. Looking round, the assistant missed another pin, which he accused his customer of taking. The theft was denied, and the bold invitation was tendered by the suspect to give him in charge. As the pin was only of small value, the firm would not prosecute, and the fellow continued his dishones practices for some time with impunity before he finally got into custody. It is unnecessary to observe that had some such a protective communication society as suggested been in universal existence, he would have been taken in a few hours. We are informed that the American triad entered a shop not far away from the very establishment that was the means of their apprehension, and although they were actually seen to steal an article, they were allowed to leave on paying for it. We know that prosecutions are always expensive and unpleasant, to say the least of it, and often a jeweller has to go to court himself, or send an assistant, who can be ill-spared, not unfrequently a day or two being wasted in this way at a police-court, and several more at the sessions or assizes. All of this trouble, however, might be minimised by concerted organisation, and prosecutions carried through by the society's solicitor. Another feature about the case is, that the trade are bringing opprobrium upon themselves from quarters least expected. Thus the *Daily Graphic* remarks:—

> "With the merits of the cases we cannot, of course, deal, as the prisoners have been remanded. But the evidence adduced points to the necessity of a radical change in the practice of the jewellery trade. Experience seems in this respect to be but an indifferent teacher, for, notwithstanding the sharp lessons that are so frequently read to the trade at home and abroad by the light-fingered fraternity, jewellers generally seem to possess an abiding belief in human probity! Familiarity may breed contempt even in the case of loose diamonds and trays of rings, pendants, and brooches, irrespective of value or price. But it is high time, in the interests of the public, that some system was adopted which should render jewel robberies more difficult of accomplishment. As it is, jewellers not only encourage

the criminal classes, but lead honest people into a temptation which must often be almost irresistible."

A graver accusation than this last sentence assuredly was never cast at the trade, and we hope that its significance will be appreciated. The idea that some such society should exist is, we hear, growing on all sides. For instance, Mr. George Edward writes :—

"The late unprecedented number of jewel robberies from some of the well-known London jewellers must surely suggest that it is high time some unity of action existed in the trade with regard to such a systematic form of theft. If any such friendly co-operation had existed, and had a description of the property stolen, and of the thieves and their tactics, been immediately communicated to the trade in a systematic manner (at the same time enlisting the services of the authorities at Scotland-yard) it seems more than probable that the American gang, three of whom are now in custody, would have been captured in their earlier attempts, instead of being successful in about forty large robberies, extending over a period of nearly three months. The fact of this gang being so successful as to evade capture during this length of time, while disposing of some of the stolen property to other jewellers, certainly points to the desirability of forming some association, pledging its members to give immediate information to the whole trade of any case of shoplifting."

Mr. Edward invited other jewellers to discuss what steps should be taken for the future protection of the trade; and amongst other communications which this has called forth, is one from Messrs. P. G. Dodd and Son and Messrs. Spink and Son, who state that recently they waited upon the heads of the Detective Departments in the City, and also at Scotland-yard, with a proposition to the effect that the principal members of the trade should subscribe a nominal sum per annum for the purpose of informing each associated members by telegram whenever an attempted or actual robbery took place, giving a full description of the thieves. The Scotland-yard authorities, in response to the appeal, undertook to give a full description of the thieves, and a warning to the trade, which appeared the following day upon their list of stolen property.

We only trust that the trade will realise that whatever may be their feelings on certain minor points towards each other, owing to the great struggle for existence, there are others of far greater moment where each man's interest is the interest of the trade.

Money Found on Convicts.

IN the case mentioned, there is a quantity of goods for which innocent third parties, who very often are made the sufferers in such instances, have parted with money; and in this connection a case just heard in the High Court will be of special interest. According to the report :—

The plaintiff was a jeweller and goldsmith carrying on business at Munich, and one night a burglary of a most skilful character was effected at his shop, jewellery and other valuables to the extent of £4,800 being taken away. Later on, two men, called Allen and Davis, were arrested at the Café Monico, in Regent-street, for this robbery, and subsequently Allen was tried for the offence, and being convicted, got ten years' penal servitude. Effects to the value of £2,500 were recovered by Thomass from Allen, and a judgment in trover had been obtained against him for £2,300 in respect of the remainder. At the time of his arrest there was found at his house a cash-box containing eleven £10 Bank of England notes, two 1,000f. notes, five 500f. notes, and £39 in gold; and in a safe taken by him at the Chancery-lane Safe Deposit, a jewel box containing several articles of jewellery. The question now tried was whether the contents of the cash-box and jewel box were available to satisfy the judgment debt either as being the proceeds of the robbery or as being the property of Allen. The contention on behalf of Mrs. Allen was that the articles of jewellery belonged to her, having been given to her before marriage; that she had access to the safe (the password being her name), and, as to the money, that the English notes were given her by her husband to take the place of money that she spent of her own for the house, and that she was a *bonâ fide* holder for value without notice, and that the French notes had been given to her by a man called Gillett, who wished her to take care of them for him. After she had given her evidence, a consultation took place between the parties, when it was agreed that Mrs. Allen should have the jewellery and the £39, and that she would withdraw all claim to the notes; and, further, the verdict of the jury was taken that the English and French notes were the proceeds of the burglary. Upon that, His Lordship stated the settlement was a very fair result of the evidence, and handed the notes to Mr. Thomass and the jewellery and cash to Mrs. Allen's solicitor, and further caused it to be mentioned to Mr. Thomass that he had never heard more honest testimony in his life; the plaintiff was entitled to the highest credit for the way he had conducted his case.

Watch Clubs.

DURING the month we have received several communications from our readers respecting watch clubs, and we notice also numerous letters in local papers on the same subject. Some things written are very obvious, and under certain conditions local tradesmen must, more or less, suffer. Curiously enough just now a similar attitude has been adopted by the jewellers on the other side of the Atlantic. The following appears from one of the American trade journals, and we give it, as this, so far as we should judge, represents the state of things on this side :—

"In the various trade centres of the country jewellers are organising against watch-clubs. The decision of the Cincinnati Court in the case against Russell Brothers is still fresh in mind, and now Philadelphia is agitating the subject through her aggressive organisation—the National Retail Jewellers' Protective Association. This is a good move. By exposing all fraudulent schemes of this kind jewellers will guard their own interests, and at the same time serve the public. Many of these clubs are lotteries pure and simple. But all are not alike. Some of them come within the limits of legitimate business enterprise, and therefore cannot be molested. Honestly conducted, the club system has increased the trade of many a jeweller, and is not to be indiscriminately condemned. The abuse of a thing is no argument against its right use."

There is no denying that watch clubs have been carried on fairly honestly and honourably for a great number of years by some firms in this country, and that there are thousands, and we might say tens of thousands, of workmen to-day who have by this means become the possessors of good watches to which they otherwise would have been strangers, and for which they paid not a cent more than if they had bought it for ready money. So far this is all in favour of the system, but when unprincipled and unscrupulous men start clubs, and give the secretaries twenty-five to thirty-five per cent. commission, pay expenses and tips, and run in the cheapest rubbish in the market, it becomes a very different matter. When a foreman, with the consent and approbation of his employers, agrees to act as local agent on a small commission, which pays him fairly for the trouble he takes, there is nothing legally wrong in it; but when, as we have heard is the case, men who have the discharging of workmen get a secretaryship, and endeavour, for their own sakes, to keep men on who are members of their club, whilst those who are not are the first to be discharged, so that many join it out of absolute fear, the watch club must be regarded as an instrument of gross and scandalous tyranny.

The Moral of the Bracelets.

IN reference to the 9ct. H.M. bracelet case from Birmingham, there are two matters to which we would call attention. First as to the queer anomalies which exist in the trade in making up goods of hall-marked qualities. We refer to such things as metal bezils and joints to silver brooches; 6ct. safety chain to 9ct. bracelets and inferior rings and connections to links of a given quality, etc. Some of these things appear to be "winked at" by the authorities, but they are, undoubtedly, contrary to the law, and liable at any time to detection and prosecution. There is, we know, an impression abroad in the trade that such matters as these are admissible, and doubtless in many instances these practices are adopted in full good faith, and with no intention whatever to transgress the law. Nevertheless, we would warn our friends against their continuance, as there will, sooner or later, be a sharp example made in these directions. Trade jealousy or official cuteness will bowl out some of these innocent offenders, who will suffer in consequence.

Our second point is to draw attention to the close provisions of the Merchandise Marks Act. We notice that an invoice given with the goods is legally a trade description, and any inaccuracy therein stands liable for prosecution and punishment. In many instances considerable laxity prevails in the making out of invoices, and it would be well if greater care were constantly used. In case of any misrepresentation—accidental or otherwise—these written documents, which are invariably filed by the recipients, would be conclusive evidence; and they are apt to appear, years after date, whenever any mistake is detected.

Further, we would deprecate the use of such ambiguous terms as "real silver," "bright" or "coloured" gold, "genuine stones," and such like; which, while they probably convey a correct estimate to any one in the trade, are yet calculated to greatly mislead the uninitiated and too confiding public. We do not pretend to say that such terms are actually contrary to the provisions of the Act referred to, but, considered in the light of its far-reaching clauses, the use of such is undoubtedly sailing very close to the wind.

The only straightforward and business-like method is to make all goods of certain recognised standards of quality, and to see that they are properly and accurately marked and described. Honesty is without doubt the best and most paying policy.

Notes About Town.

(By our London Correspondent.)

A New Sovereign Purse.

I SAW in the hands of a Russian Prince the other day, a gold sovereign purse, which had all the necessary elements of safety in it, and all the elegance and charm of novelty that one could expect to find combined in a single article. There was a ring mail bag of gold, the mouth of which was gathered on to a rack or trellis of gold, which either opened or closed as necessary. When the trellis was closed it formed a round bundle, over which a gold cap shut down with bayonet top, something like a smelling-bottle top. In the top of the lid was set a large diamond. Dispensing with the diamond, this purse could easily be made; and the ease with which it opens and closes, together with its elegance and novelty, will secure a future for it no doubt.

* * *

The Spoon Craze.

The idea of collecting spoons from every European city, which began about three years ago in earnest by our American relatives, has developed into nothing short of a craze. In London the trade disregarded it, but it was not so on the Continent. A number of cities have laid themselves out to the production of symbolic and characteristic spoons. How much additional trade this has brought them it is not easy to say; certain it is, that our American cousins very rarely buy a larger article first visit. They look in, and guess they'll call again if they are favourably impressed. Next time they bring a friend, and are all sure to want "odd spoons." Show them something this time; they buy, and the transaction will be sure to lead up to better business.

* * *

Something new in Spoons.

A very effective spoon has recently been brought out, perhaps the most beautiful ever attempted. The bowl of the spoon and lower part of the handle can be of any of those designs which marked the departure from the O.E. and fiddle, or any new divergence the designer can fancy. The upper part of the handle is like twisted wire-work, in the interspaces of which is transparent enamel. The effect of many is like that of a cathedral window. The delicate tints of enamel, the soft blendings of colours, or brightness of their hues, contrasting with the gilt-work of the spoon, must be seen to be realised. It struck me in a moment what taking "odd spoons" they would make by putting the arms of

St. George, St. Andrew, or St. Patrick in the handle, or the three united as the Union Jack, especially if the latter hung pendent down the tapering handle.

* * *

Mexican Onyx. There seems to have been a large quantity of clocks made up lately, both in America and France, in the so-called Mexican and Algerian onyx, which are finding their way into the market. Several of the American manufacturers are turning out new models, and the French are equally active. My readers are, of course, aware that in reality it is not onyx at all. Onyx is a hard quartz, upon which no impression can be made either with a knife or file. The material employed for clock cases, on the other hand, can easily be scratched with either, it being only an ordinary marble of rather beautiful colour, deposited in caves and crevices through which calcareous water passes, and known as stalagmite. The body colour is usually an ivory hue, striped and banded in tortuous and many-shaded lines of all widths and colours, the prominent one being yellowish brown, from some salt of iron. Amongst the various colouring matters that enter into the composition a place is claimed for the following: purple gold, yellow silver, green copper, white arsenic, and zinc. Sometimes the colouring matter was introduced contemporaneously with the formation of the material on the bottom of the cavern; at others it has been introduced subsequently, through secondary cracks produced by fissuring caused by earth movements in earthquakes, &c. The Indians quarry it out in the most primitive manner, it is said, by drilling out deep round holes, and inserting a grooved piece of wood; hot water is poured into the grooves at night, and the swelling of the wood causes the block to split along the line of holes; subsequently it is sawn into slabs, and polished with the hand. It closely resembles many of the gypsums, or alabasters as they are usually called, but is rather harder, takes a better polish, and is far more translucent. This latter quality it is that probably gives it its characteristic beauty.

* * *

What is Wearing. There can be no denying that a great impetus was given by the Paris Exposition to the demand for coloured stones. Coloured stone necklaces are in great demand in Paris, and now that fashion has taken the necks of dresses lower again, absolutely necessitating necklaces, broad coloured stone ones are just the thing to bridge over fashion and modesty. The Langtry fob chains are still worn. The variety of charms pendent from them is very great, and they are now jewelled to any extent and lend themselves to diversity of design. Not only in Paris is the number of these very great, but in London also, while the demand is daily on the increase.

* * *

Silver Novelties. Silver chatelaines are still rising in popularity, and even in size, as are buckles and clasps. The copies of the old Nuremberg things, or what passed for them, have given place to some real art productions and reproductions of old masters. In Paris they are even more worn than here, but probably the various fashions will reach here in time. There they have elaborate silver girdles for looping up skirt draperies; while it has laid as tight a hold on the writing table as it has had on the toilet table. Shagreen ornamentation is also resorted to with pleasing effect.

* * *

Jeanne d'Arc. This real or imaginary heroine has once more been brought to the front, and brooches and bracelets made in all sorts of metals are selling in Paris, giving representations of her.

* * *

Photos on Watch Dials. I have heard lately of several houses being asked if they could photo likenesses of lovers, etc., on watch dials. The idea is not exactly new. A lady and gentleman, one on the right and the other on the left, look very nice, but when only one is photo'd there is a slight one-sidedness about it.

* * *

New Jewelled Hair Pins. I have seen several times during the month a very pretty and effective hair pin. The top is a round ball about three-quarters of an inch in diameter, made of common opal of a milky blue. In this are gold gipsy collets, in which are set diamonds of about one-sixth to a grain each. I have also seen them in coloured stones. The new coloured grapes are also similarly set with a dewdrop diamond.

* * *

What is going on. The principal events of the month, or those that are most talked about, are the Benevolent dinner, with the Lord Mayor at its head, and the Jewellers' and Silversmiths' Concert. Every jeweller, this year, feels one step nearer to the chief magistracy of the world. The smoking concert, both in its idea and its success, is still very much spoken about. Formerly the idea of a jeweller daring to think of recreation was out of the question; now, however, happily, things have changed or are changing. Many of the old late houses find that little, if anything, is lost by closing earlier, and many of those who feel they cannot well close on Saturday afternoons are sending away their assistants in turns. That the hours of shop labour are shortening all round, not only in the jewellery trade but in others in which early closing was formerly considered impossible—such as hosiers, outfitters, and the like—is certain; only this autumn there has been a general agreement amongst the chief of these trades to close earlier, and I venture to think that if a little united effort was made the hours might be further shortened with no loss.

* * *

Lectures on Gemology. Mr. W. J. Lewis Abbott, who for some months past has been contributing a series of articles on gems to our paper, has begun a course of lectures on the science of gems at the Horological Institute, on alternate Tuesday evenings, to last through the winter months. The first lecture was delivered on November 11th, and the next on November 25th. On both occasions the hall was full, and many of the audience lingered round the cases for over an hour after the lecture was over, listening to Mr.

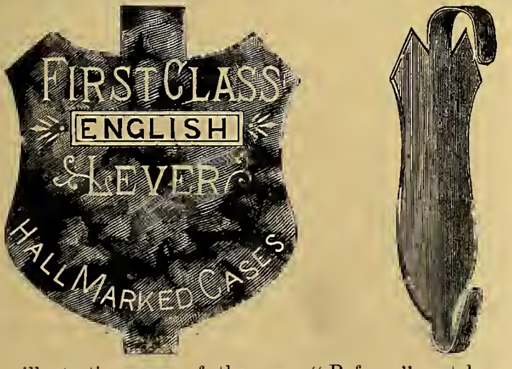
Abbott's further demonstrations and asking questions, and appearing to be in the highest degree interested.*

* * *

Fashionable Articles for Personal Use.

A fashion writer informs her readers that "earrings with drops are beginning to be seen again, but the drops are quite in miniature so far. A dainty little pair are formed of thistles in diamonds, just the flower falling downwards. Pear-shaped pearls, pendent from a diamond in the ear, make one of the prettiest ear ornaments ever yet designed, so we are glad to see them again fashionable. There seems to be just now a desire to revive all old fashions, and we note with pleasure the loose chain bracelet with padlock amongst other old favourites. Pansies have had a long run, but their day is not over by any means; they hold their own even with the newer harebells. A scent bottle has its top entirely overlaid with one large enamel pansy. A silver horseshoe with the centre filled up forms another scent bottle; the top is an enamelled blue and red jockey cap. The 'tumbler' scent bottles have stoppers now, instead of silver or silver-gilt tops, in some cases. The stoppers are just like those used in large glass bottles, and fall into the neck, the only difference being that they are of silver. A few of the small fans with folding handles are to be seen about. The handle, which is usually of tortoiseshell, is attached to the centre of the same pin that holds the sticks together, and when turned up folds up with them. In other cases the handle spreads out into two forked pieces that are joined on to the outer sticks of the fan. These little fans are pretty, but look rather fanciful for ordinary use. Artificial flowers are often laid on silk and gauze fans for evening wear; the flowers correspond with those that form the subject of the painted decoration; for instance, if the fan mount is painted with lilies of the valley, a few sprigs of artificial lilies will run down the folds of the mount; and so with violets and forget-me-nots. A recent novelty is an en-tout-cas, with a fan that slips into the handle. Another has the cap of the handle made with a hinge, so that it lifts up like the lid of a box; inside the cap is a small mirror. We Englishwomen must be getting somewhat vain of our appearance it seems. What looks like a silver tablet for memoranda proves to have a mirror inside instead of the ivory leaves. Then there is a folding comb, such as we used to call a pocket comb, only the case is silver-gilt instead of tortoiseshell, and both these articles are to be attached to chatelaines."

We regret the omission of the subjoined illustrations, referred to in the third paragraph on page 104 last month.



The illustrations are of the new "Reform" watch and jewellery tickets, ticket and hook being in one piece.

Scientific and Otherwise.

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Burma Ruby Mines.

THE latest news is of a very satisfactory nature, there being a genuine improvement all round, both in the weather which regulates the health of those employed, and also in the finds. The staff of Europeans numbers, we believe, about twenty. Their attention has been directed to driving into one of the limestone hills, in which caverns are found that contain the precious gems over which the Kings of Burma have ruled as lords. It will be thus seen that ruby mining in Burma differs from gem-hunting in every other part of the globe. A parallel case is that of our own British Cave Hunter (*vide* Boyd-Dawkins "Cave Hunting"). Most of our readers will have visited some limestone district, such as Devon, Yorks, Derbyshire, S.W. Wales, &c., and will remember possibly such caves as Kent's Hole, Brixham Cavern, and others; these are usually now on hillsides, in dry valleys, high up beyond the reach of any water; but in long ages ago, when our unclothed forefathers hunted the cave bear, the elephant, and the lion over this modern holiday resort, there was a big river flowing down the valley, only then beginning perhaps to be excavated. In time of floods, which in this period were probably very frequent and very great, this river crept up the hillsides, penetrated the cavern, and carried into it a large amount of *débris* of its muddy waters, the current action of the stream that entered doing a rough sorting in the cavern, floating off a great deal of the light stuff, and leaving behind the material we know as cave earth, which contains the relics of all the river passed over in its course towards the south of what was then Europe. In this material the prehistoric archæologist finds his treasures, and in a similar cave earth, which they call *byon*, are the rubies found. Having come across the material, they have now to wash it to decide upon the extent of fortune which has followed their enterprise.

Silver Refining by Electricity.

THE subjoined process of refining silver electrically is described in the *Engineering and Mining Journal*:—The following method is most suitable for the refining of auriferous silver containing about 11 per cent. of gold, the cost in this case being only about 14 cents per pound. The principle upon which the process is based consists in using in an ordinary electrolytic bath anodes of an argentiferous matter, and a thin plate of pure silver as the cathode. The bath consists of a very weak solution of nitric acid containing about one per cent. of the acid. The anodes, which are about one-half inch thick, with a surface of about 13·5 square inches, are placed in muslin bags, which retain the gold, platinum, peroxide of lead, and similar foreign materials contained in the matte. The current used is 150 amperes, and the potential difference between the plates one volt. During the whole period of work brushes are kept moving up and down the silver plates, sweeping off the silver deposited into troughs put for the purpose at the bottom of the bath. Those troughs are removed from time to time, and the silver taken out and sent to the furnace. If the matte contains copper, this is dissolved by the nitric acid, but is not deposited on the cathode.

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* We have not reported these lectures in any way, as they are to appear in our contemporary, *The Horological Journal*. We have tickets for them, which we should be pleased to forward to our readers on receipt of stamped envelope, admitting to the course, the dates and subjects of which are printed on the tickets.—Ed.

Discovery of Gold at Birkenhead.

WHILE several men were engaged in sinking a well shaft in the cellar of Mr. H. Dobb, in the Haymarket, Birkenhead, the other day, they came upon a thick vein of gravel. After passing through strata of sand, blue clay, and rock, a boy, in clearing away the rubbish, noticed that the gravel was full of bright, sparkling specks. The owner, on having his attention drawn to the fact, took some specimens to a jeweller, who submitted the sample to tests, and pronounced it gold. The gravel was mostly about the size of peas, and the large gold specks were adhering to the sides. It is thought that the vein would be worth working but that the land around is heavily built upon. It is stated that the neighbourhood was at one time washed by an arm of the Mersey.

We should like to see the "gold" before we passed opinion upon it. Not long since a jeweller sent us up a sample of "gold" he had obtained from men who found it under similar conditions, which, however, turned out to be yellow mica, which withstood the jeweller's acid test for gold, whereupon he thought he had got a fortune.

Metal Casts of Insects, Leaves, &c.

A METHOD has recently been revived that was formerly employed in the early days of geology to show the origin of fossils, whereby metal casts of delicate natural objects, such as flowers, leaves, insects, etc., are obtained in the following manner:—The object—a dead insect—is first placed in its natural position, with feet fastened with wax upon an oval vein of wax. It is next suspended within a pasteboard or wooden box, by means of a few fine wires, so that it is suspended free within. A few thicker wires are led to the object from the sides of the box, to form air-ducts. A sharp-pointed piece of wood is placed upon the back of the insect, and serves to form the hole for casting. The box is next filled with a paste consisting of three parts powdered plaster of paris and one part brick-dust, stirred with a solution of alum and sal ammoniac. It is best previously to paint the object with this mass, to avoid the formation of air bubbles. After the form has hardened, it is slowly dried, next heated strong and stronger, whereby the body within is reduced to ashes, and then left to cool slowly, to prevent cracking. In order to get out the ashes, the cold form is filled with mercury, well shaken, and poured out again, repeating the operation as often as necessary. The thick wires are then withdrawn, the form heated and filled with the molten metal. After cooling, the gypsum is carefully softened in water and broken away.

A Problem for Solution.

IT is reported that either Mr. Labouchere or someone else wrote in *Truth* the other day:—

"A few days ago I was standing by an American gentleman, when I expressed a wish to know which point was the north. He at once pulled out his watch, looked at it, and pointed to the north. I asked him whether he had a compass attached to his watch. 'All watches,' he replied, 'are compasses.' Then he explained to me how this was. Point the hour hand to the sun, and the south is exactly half-way between the hour and the figure XII on the watch. For instance, suppose that it is four o'clock. Point the hand indicating four to the sun, and II on the watch is exactly south. Suppose that it is eight o'clock, point the hand indicating eight to the sun, and the figure X on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing that everyone else knew, and happening to meet Mr. Stanley, I asked that eminent traveller whether he was aware of this simple mode of discovering the points of the compass. He said that he had never heard of it. I presume, therefore, that the world is in the same state of ignorance. Amalfi is proud of having been the home of the inventor of the compass. I do not know what town boasts of my American friend as a citizen.

As many of the members of the trade we have since met with are divided in their opinion as to how much honour really belongs to that American town, we thought it might be interesting to our readers to solve this problem. We do not say whether it is right or wrong, but we shall be pleased to publish next month the answers and opinions of any of our readers, together with those we have already heard expressed.

Pocket Sundials.

ANENT the foregoing, it is interesting to note in the last century there were such things carried in the fob as compasses that were also sundials. Mr. J. S. Thomson, jeweller, of Dumfries, a day or two since exhibited a very fine specimen to the Dumfries antiquarians. It is of Parisian make, of a very pretty design, and no larger than a watch. Only another of the kind is known to exist in this country. It is figured in Mrs. Getty's "Book of Sundials," and is said to belong to the Rev. J. Sayce, Sheffield. The one in charge of Mr. Thomson is made of silver. The dial is marked with four lines to indicate the time at latitude, and the gnomen can be elevated or flattened at pleasure.

The Accumulation of Diamonds.

THE *Financial World* observes:—"The world's stock of diamonds has increased enormously in the last fifteen years. In 1876 the output of the African mines was about 1,500,000 carats; last year it was over 4,000,000, and the great trust which controls all the principal mines asserts that it has 16,000,000 carats in sight at the present time. Meantime, says *Iron*, the demand for diamonds has greatly increased, and they are higher to-day—partly because of the trust, but also because of the increased demand—than they were a year or two ago. In one respect, the diamond industry is different from all others. Its product—that is, of gems—is never consumed. Of gold and silver, a much larger amount than most people would believe is literally consumed in the arts past recovery, but a diamond once cut goes into the world's great stock, and is liable to come upon the market at any time. Hence the world's annual taking of diamonds, which appears to be steadily increasing even at advancing prices, is an index of how much of its surplus earnings it can afford to expend yearly in this particular form of luxury. The romance of diamond mining is all gone. It is now a matter of excavating vast beds of blue clay by machinery, washing it, and sifting out the diamonds, which, after being roughly sorted for size, are sold in bulk by weight. The men who do the actual work are mere labourers, and their pay is proportionately small."

In this there is much truth; but we think if the writer had ever seen the "blue" or "buff," and experienced its stubbornness, how it has to be laid out to weather and all sorts of things before any effect can be made upon it; had he but known how large a fortune awaits the man who shall be able to reduce this material in an easy method—he would rather have spoken of it under the name of its nearest British ally—a dense, hard, serpentine rock—than a clay, which usually means mud dried a little hard, but which, upon the addition of water, can be reduced to any consistency.

The Silver Trade.

London Business.

ALL houses that manufacture in London have been very busy during the last month, either on orders, or in anticipation of Christmas demands. There is no house that we know that has got a usual supply on hand just now, and many large and very conservative houses are giving a trial to new manufacturers or factors who happen to have the articles they require—a circumstance which in many instances will probably prove the thin edge of an ever pushed wedge. We do not for a moment advocate selfishness on the part of a manufacturer, but when he has a good firm footing in a house he ought to keep it. There is no denying that Christmas trade becomes a very important thing now, when we hear of houses doing £2,000 a day in legitimate season trade over the counter at Christmas. A seasonable trade like this assuredly must be prepared for. As early as the fore part of October this year, Christmas things were in demand, and by the arrival of November several manufacturers were absolutely out of many things, with no hopes of being able to get a fresh supply in time.

* * *

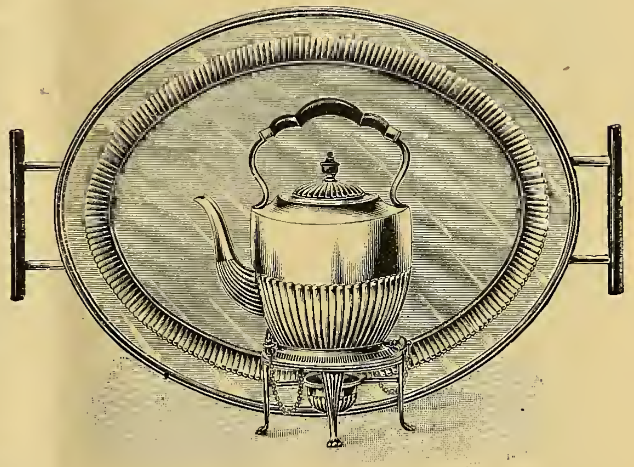
A Large Silver Order.

Messrs. Elkington have just completed, and have now on view in their showroom in Newhall Street, an exceptionally important silver dinner-service, executed for a South American gentleman. The work includes 210 large pieces, and fifty dozens of spoons and forks, specially made to harmonise with it; it weighs 7,000 ounces, and its money value is £5,000. The period of the service, decided by the owner, is that of Louis the Sixteenth, which has been very skilfully treated in the designs made by M. Willms, the art director of Messrs. Elkington's works, who, while availing himself to the fullest extent of the artistic characteristics of the style, and preserving unity of design, has maintained due restraint, and has introduced many detailed enrichments of specially graceful quality, executed with rare delicacy. The principal objects of the service are a plateau, twelve feet in length, capable of division into three sections, and richly decorated with ornamental mouldings, and laurel wreaths, in low relief. The centre-piece is a singularly fine work, boat shaped, the ends enriched with charmingly modelled female figures, and the surface generally ornamented with repoussé work in highly effective designs. Two candelabra, of seven lights each, are also very notable; they are marked by gracefulness and boldness combined. These remarks apply to all the principal pieces; while the smaller dishes, and other constituents of the service, are peculiarly noticeable for ingenuity alike of their form and their decoration. A dessert service, including two large and remarkable rose-water dishes with appropriate jugs and goblets, and a couple of tea services, complete the work. A few of the pieces are partly gilt; but with these exceptions the service is executed in oxidised silver, which is not even burnished in part, somewhat of a novelty in such work, but one which imparts unusual solidity of appearance, and, so to speak, tones down the salient qualities which are too often noticeable in ornaments of the Louis Seize period.

* * *

Presentation to Major Malet.

The close of the Royal Military Exhibition at Chelsea has been signalised by a cordial recognition of the debt due by all concerned to Major Malet, the honorary director, whose zeal, energy, and ability have so materially contributed to make the enterprise a success in every way. A committee of the exhibitors at the Royal Military Exhibition has faithfully represented the feelings of them all in organising a handsome testimonial to Major Malet, which took the form of a handsome silver tray and kettle, supplied by Messrs. Mappin and Webb, one of the leading firms of the exhibitors. The tray and kettle were made to the special order of the committee, and designed by the manufacturers in the Queen Anne style. They bear the inscription: "Presented by the Exhibitors to Major G. E. W. Malet, Honorary Director R.M.E., Chelsea, 1890."



Jewelled Dog Collars.

THE ultra-fashionable young woman who still clings to her dog is having the silver collar made to duplicate exactly her favourite bangle. The plain leather bands, and those studded with metal, are hopelessly old-fashioned; chains have gone out, beaten into bracelet designs, and solid silver is the only sort of neck wear in which a self-respecting dog will allow himself to appear. Some of these new collars are wonderfully rich and costly. One, the property of a luxurious King Charles spaniel, cost his mistress considerably over $100. It was fully an inch wide, and as thick as the animal's comfort would allow. The entire surface was richly engraved with a Court scene from the reign of Charles II. The work was fine and artistic, and on either edge of this superb collar a line of tiny turquoises was set deep in silver. If the young woman affects cats, she has the silversmith make six or eight light silver hoops, some cut and others plain, and these bright rings he welds around pussy's furry neck. A beautiful pet Angora, who lies on a cushion and feeds upon cream, wears fine cut silver hoops that sparkle like jewels every time she moves.—*American Paper.*

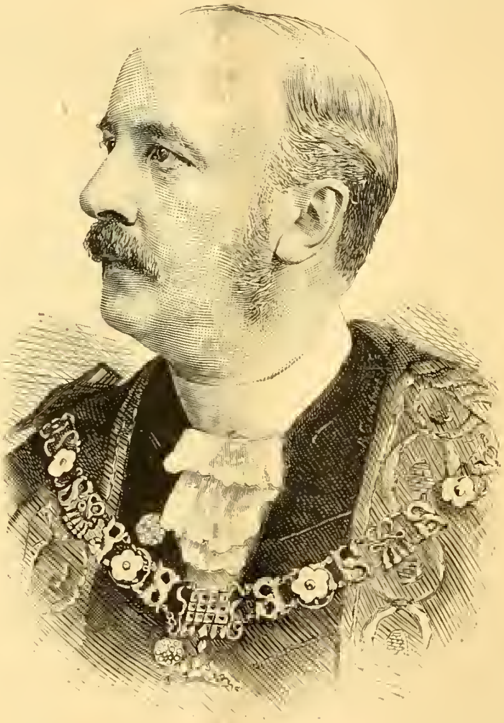
LORD MAYOR SAVORY.

ALDERMAN SAVORY, the new Lord Mayor of London, of whom we present a portrait, is a born goldsmith, the business to which he is attached having been established in 1751. He was born in 1843, and after being educated at Harrow, he joined his father in the old business, Messrs. A. B. Savory and Sons. Afterwards, owing to some family alterations, the ownership was transferred to a limited company, the shareholding being confined to a select few. The Lord Mayor's public career is too well known to require a word from us. Our engraving is from a photograph taken by the London Stereoscopic Company.

Art in Birmingham.

(From our Local Correspondent.)*

THE visit of the National Association for the Advancement of Art made a mild excitement in the City during the first week of November, and there were a great many papers read, and a great many speeches made, and a great deal of sighing over the degenerate condition of Birmingham and Industrial Art. But the sighs and the speeches and the papers, though evidently well meant, are now for the most part forgotten, and the Congress too. The members of the Association (some of them illustrious) have gone their ways, and we hear of them no more. I attended a good many of the meetings, but found there was not much to choose between them in the point of dulness. Now and then a wise remark startled the audiences, but the excitement soon subsided again. The receptions were the best things, because one wasn't obliged to listen to "chatter about art" at them.



It was not till the third day of the Congress that art, and its application to Birmingham manufactures, was approached, and these celebrated artists decried Birmingham jewellery and metal work in scathing terms, because, forsooth, it was manufacture and not handicraft. These worthy painters of drawing-room pictures and boudoir sketches seemed to overlook the fact that the very people who bought their pictures also bought Birmingham manufactured jewellery, and care not at all whether it was manufactured or done by hand. Why, these very people would only be too glad to buy their landscapes and seascapes in greater number if they could get them cheaper by having them machine-made. The President of the section, Mr. A. H. Macmurdo (an architect, but, apparently, an intelligent one), had been grubbing around Birmingham, he said, and had actually found an artistic plate and a beaten copper jug, which were made for export, but which didn't suit the home trade—they were too artistic! What a task Mr. Macmurdo and his colleagues have to educate we Birmingham people up to our own jugs and plates!

After referring to the inartistic bedroom ware which adorns the Birmingham washstands, as preliminary remarks to the subject in hand, the President called on Mr. J. W. Tonks to read his paper on "Art as Applied to Jewellery and Personal Ornaments." This was a valuable contribution, in which the author pointed out that at the present day we have to decide upon which principle we shall work—the classical or the mediæval; the useful and ornamental or the merely ornamental without regard to use. He strongly advocated the more extensive use of enamel in modern jewellery, and in referring with feeling to the jewellery worn by men at the present day, he said he had tried to force some enamelled cuff links upon the market — without success, however, for it all went to that bourne from which no jewellery returns. In conclusion, Mr. Tonks uttered a fervent protest against the introduction into this country of the weak and senseless Rococo style which was so much favoured in Paris last year; he said that it was a senseless frivolity and a senile degradation. His paper was followed by a discussion, in which Mr. J. Brett, A.R.A., and Mr. O'Farrell took part.

Another very useful paper was that on "Metal Work," which Mr. Starkie Gardner read to an audience of artisans. Councillor Charles Green presided, and said he wished a number of working men could have attended the meetings of the Congress, so that they could have disseminated the knowledge gained to their fellow workmen afterwards. Mr. Gardner's was a very sensible address. In it he pointed out the directions in which Birmingham metal work failed, and said he wished the city held the position it did thirty years or more ago when it led the Gothic revival in manufactures. What was needed was a good designer—an artist, but not an æsthete—in every large works, with a practical knowledge of the trade for which he worked out his designs.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.—Ed.

Midland Jottings.

By MERCIAN.*

PROCEEDINGS in Court are still the order of the day, unfortunately. The case of Mr. E. M. Evans, of Northampton-street, Birmingham, has now been settled by the magistrates, who have inflicted a fine of £10 and costs, which included a fee of five guineas for counsel. These costs, however, did not cover the expenses of the proceedings, but the bench is averse to making Police Court actions expensive to the parties concerned. This case will be useful to every one in the trade, for the decision clearly indicates that the amount of silver solder used in the manufacture of the bracelets in question was very much in excess of what was necessary. Of course as long as silver solder is used at all in the "making" of gold pieces it is impossible to have an absolute standard, for the piece if melted down after making would assay at a less value than the strip which in the first instance was sent to the office. It thus becomes necessary to attempt a definition of what is a "reasonable" amount of silver solder to use in making a gold bracelet; but this I do not intend to attempt here. Suffice it to say that every practical jeweller will be perfectly aware of how much should actually be used.

IN this case it is clear that an excessive amount was made use of; and, without at all reflecting upon either the decision of the magistrates or the defence of Mr. Evans, it becomes apparent that a master is responsible for the doings of his workpeople, as well as responsible to the general public to whom his goods are sold. Mr. Evans was a jeweller's factor, and purchased the manufacturing business with which the case is concerned, so that he was not acquainted with the actual processes of manufacture; but the unfortunate part of the thing is that it all came out over that curse of modern trading—underselling. This it is which is the cause of half the evils connected with the industries of to-day. If manufacturers would but content themselves with legitimate trading, a good deal of ill-feeling would be prevented and much better profits result.

AS an example of the unsatisfactory state of affairs into which such a case as this lands some sections of the trade, may be instanced the letter from a Birmingham factor to one of the local papers, expressing the difficulty he is in of disposing of his stock of Hall-marked 9-carat bracelets, which are not 9-carat at all. He cannot sell them, or he renders himself liable to a fine for each one sold. As waste metal they are not worth half the money he paid for them as 9-carat goods.

AS regards the Brenholz case, there is some talk, by a section of the creditors, of making an application to the Official Receiver to take the affair out of Bankruptcy. Whether there is any definite ground for the report I am not prepared to say, but I certainly think, if the rumour is true, that creditors should refuse such an arrangement if it is proposed. At the public examination the debtor failed to put in his appearance, and the Registrar stated that such procedure was contempt of Court, and that he should adjourn the case *sine die*, but on representations being made on behalf of the creditors he consented to call a further meeting a fortnight hence. From what I have since heard the debtor has apologised for his non-attendance.

STILL another case of prosecution by the Assay authorities: in this instance that of Mr. Wm. Cook of Hockley-hill, who was charged at Bradford with selling base metal falsely marked as 9-carat gold. Mr. Sam Wilkinson of Bradford, jeweller, purchased various lots of jewellery, and in 1888 three dozen rings (the inner linings of which were marked 9-carat) at 36s. the dozen and 5 per cent. discount for cash. Mr. Wilkinson had these rings returned by his customers from time to time, and the Assay Office in Birmingham were communicated with, and they instituted the present proceedings. The case is now adjourned, and until judgment is pronounced no opinion in particular may be expressed; but if the charge is true, it is a most scandalous thing that the repute of the Birmingham jewellery trade should thus be impugned. On this as well as on the Evans case I believe steps will be taken at the next general meeting of the Jewellers' and Silversmiths' Association. If something to obviate this kind of thing can be instituted by this body, it will be conferring a real boon on the trade.

THE prospect of the jewellery trade, as far as orders are concerned, is of the brightest, and a dealing manufacturer of the quarter informed me that the signs of the times indicate that the revival will continue for several years. The improvements have not been rapid, but they have taken place steadily and gradually, and the future looks as bright as the present actually is. In gold pieces makers are well employed. Mr. J. M. Banks reports a good demand for gem work, of which he has just issued some new designs, flowers and birds predominating.

IN some directions I find there is a slight falling-off in the demand for silver jewellery, but Messrs. John Reading and Sons, of Spencer-street, who manufacture this class of ornaments very largely, are very actively employed. The increasing demand for gold ornaments has not appreciably affected the silver trade I think, the slight falling-off being but temporary.

I AM very glad to find, on inquiry among the larger firms engaged in the electro-plate trade, that business is very good, which is not only due to the brisk demand or Christmas season goods, but is the result of a steady improvement of affairs. One firm informed me that although their people are working overtime they cannot cope with the orders, several of which are now very much behind. I hear of stocks getting extremely low, with no possibility of renewal.

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ALTHOUGH I have seen a fair number of pretty things for the season, there is not much that is fresh in running goods. The demand for the older patterns keeps up, and makers are so busy in supplying this that they have but little time to think about new ones. After Christmas there will be a lull, and I hope I shall then be able to call attention to some new ideas in electro-plating and gilding.

THERE is an excellent demand for nickel goods at present, which suffers but little from the increased consumption of silver articles which, including toilet and fancy goods, are now having a good run. Messrs. Elkingtons and Messrs. Horace Woodward and Co. are busy with their ordinary run of goods, as are also Messrs. Wilkinson of the Pelican Works, and Messrs. J. Hands and Son, whose Continental trade remains steady. Messrs. Daniel and Arter and the Potosi Company are well employed on their specialities in white metal spoons, forks, etc., and the latter firm have contracts for the Admiralty on hand, as well as large orders in general electro-plated ware for the trade. Messrs. Bromett and Ashbury are busy with foreign orders, their specialities being glass and china mounted in E. P. for every purpose. In their show-rooms I saw some lovely dish covers for India. They are of glass, so that the viands beneath are seen. The invention consists of an E. P. rim and a handle. These covers are not for hot dishes, but are used more on account of the flies. They are somewhat expensive, but extremely handsome, and will add very largely to the appearance of any table.

A MATTER of considerable importance to Birmingham at large, and the jewellery and electro-plate trades in particular, is the new tariff which the French Government intend to bring before the Chamber of Deputies and the Senate. The proposals, when examined, exhibit the fact that they are very strongly Protectionist, and in many respects they fall with particular severity on British manufactures. This *projet du Gouvernement* is to come into force the moment the existing commercial treaties between France and the other nations expire. The project contains two scales, *générale* and a *minimum*, which are to be accorded in reference to the treatment given by the various countries concerned to French exports. An analysis of these tariffs shows that they are quite prohibitive to some of our productions, but on those which France cannot herself supply to any considerable extent, they fall more lightly. While pig iron duty is two francs, gold, silver and electro-plated manufactured goods are 600 francs per 100 kilometres. In fact, these, with cutlery, are the highest duties in the whole scale. This is out-McKinleying McKinley, and the English Government should certainly make an early and an urgent protest against the adoption of such tariffs. The American lesson does not appear to have taught Jacques Bonhomme anything at all; but he will have to learn it sooner or later, and the sooner the better for everybody concerned.

IN reference to the paragraph in my Jottings of last month with respect to the Trades Union question and the Operative Jewellers' Society, I was fortunate enough to have a conversation the other day with one of the leading master jewellers. He said a section of the men seem to forget the state of things which existed three or four years ago—a time when many manufacturers scarcely had an order in their hands; but the men were not allowed to be entirely without work. Two or three days a week they were employed in the workshops, but they knew well enough that this employment was only on sufferance. The goods they made were not required, the wages they received came out of their masters' capital; it was not profit. It practically amounted to charity. In addition to this, great efforts were made by the masters and the trade generally to improve the condition of things. The Princess of Wales was petitioned to make an effort to set the fashion in the wearing of jewellery, and every method of making the industry more prosperous was tried.

THE result of all this and the general revival of trade is that the jewellers' quarter is once more alive with business, and the activity consequent on good trade is everywhere apparent. An enormous increase of wages has naturally taken place, and now some few of the men would demand now they are well off, where they pleaded when they were poorly off. It is a case of ingratitude, but it is something besides. It evinces a want of confidence in the masters which is entirely to the discredit of the agitators. In times of good trade, manufacturers are only too pleased to secure a good workman at a good wage. I do not for a moment deny the rights of any man, but masters have rights as well as men, and if an operative is dissatisfied with his wages, and fails to persuade his employer that he deserves a rise, the remedy is obvious: let him go elsewhere. Masters are always glad enough to secure a good workman. There is no reason why the men should not combine into an association in a like manner to that in which the masters have done, but their union should be for protection, not for any hostile purpose. Their ends will be served better by representations to the employers than by passing absurd resolutions about the "only" method of securing a higher rate of pay.

MESSRS. CORNISH BROS., of New Street, Birmingham, have published a sixteen-page pamphlet on "Industrial Art" by Mr. Auguste Willnes, the Professor of Sculpture to the Birmingham Royal Society of Artists, and director of the staff of designers at Elkingtons, Limited. The writer deals with the present position of English art-workers; with famous industrial artists; he points out the causes of failure of some of our schools of design, and states what reforms he considers are needed, and concludes with an earnest appeal that young men who intend following the profession of design in industrial art, shall have the advantage of being taught by industrial artists, instead of by painters or drawing masters. The pamphlet shows Mr. Willnes to be a complete master of the subject, and all those who are acquainted with the work turned out by Elkingtons (and who is not?) will recognise that he is himself a great industrial artist. The pamphlet is very well worth reading by everyone who is at all interested in, or connected with the subject, and a large circulation would have a beneficial effect on our industrial arts. It is sold for sixpence.

MESSRS. SWINDEN AND SONS, of Birmingham, have substituted three massive iron girders for a large number of bricks in their premises in Temple-street; and Messrs. Harris and Sheldon have fitted a handsome double-front of mahogany, which extends from the pavement to the first floor, and contains two large plate sheets, one above the other, divided by a nicely ornamented cornice. By this means the show-rooms, and the workmen's rooms upstairs, are very much better lighted than they used to be, while the exterior of the premises has been very much improved thereby. The display in the closed case window is not large, but it is varied and striking, and contains the leading lines for which the firm is celebrated. They include adjusted, non-magnetic, English and Waltham watches in gold and silver cases; English timepieces in ebony, oak, and marble, and ships' chronometers, &c. In the show-room may be seen some fine antique long-cased English clocks in carved oak, and station and factory clocks. The firm report business fairly busy.

AMONG brass, copper and black wrought iron goods for the Christmas sale, which will add very largely to the appearance of any well arranged window, I should like to mention the goods turned out from the factory of Messrs. Townsend & Co., of Ernest Street, Birmingham. They are chiefly of two styles, Louis Quinze, and Voce's Patent Tube, the latter being very pretty, and consisting of tube made to resemble Whangee canes. The effect is very good. In these two styles, Messrs. Townsend fashion a large number of articles, including dinner gongs, hand mirrors, candlesticks, table kettles, etc. The goods are excellently finished, and very artistic in design.

COVENTRY jottings are that Messrs. Kinder, Waddington, Drinkwater and Carbett, all of them watchmakers, have been placed on the Town Council. Mr. Charles Read and Mr. Charles John Hill, both well-known manufacturers of watches, have been elected Aldermen, and the latter gentleman takes the office of Mayor for the second time. The Coventry Technical Institute is in a flourishing condition, and its council for the year includes the names of Mr. John Rotherham (of Rotherham and Sons) who is the President; the re-elected Mayor; Mr. Wm. Gooding (of Rotherham and Sons); Mr. Rowland Hill (of Thomas Hill and Co.); Mr. J. I. T. Newsome (of J. Newsome and Co.), and Messrs. P. Cohen, Fridlander and Player. A distinct revival of watch-case engraving is noticeable. A new centre-seconds stop-watch has recently been patented by Mr. R. Fennell, who will probably have a good sale. There is a difference of opinion as to the scale of wages for watch movement gilding. A Coventry gilder thinks 3s. 6d. nearer the mark than 6d., and he will be glad to see an early change for the better in this department.

Horological Notes.

ORIGINAL AND "CLIPPED."

Is Watch-manufacturing quiet? IT HAPPENED (writes a *Watchmaker* correspondent) to be in one of our largest manufactories of English levers in London the other day, and overheard a conversation which both grieved and delighted me. A wholesale man was remonstrating with the manufacturer for not letting him have goods to fill up back orders. As soon as he had gone, I thought I would try and see the reason of this. "Oh!" said the manufacturer, "we are absolutely at a standstill for pivoters. I have advertised in this country, in Switzerland and France, but cannot possibly get them." "But what about girl labour?" I inquired. "That is the very thing we are now resorting to," said the manufacturer; "we have taken on a large number of girls, but we have first to teach them. Some of them are coming up nicely, and in a short time will be able to do the work well; and then I hope we shall be able to pull up some back orders."

The Self-Winding Clocks. A SPRINGFIELD (Mass.) paper speaks as follows of the Self-Winding Clock Co.'s clocks, made by the Seth Thomas Clock Co.: A chain of synchronized self-winding clocks is being established here through the efforts of Henry Denver, manager of the Western Union Telegraph Company. The timepieces do not obtain their motive power from electrical action, thus being subject to hindrances resulting from entire dependence on electrical currents, but instead gain the necessary force from the action of a fine spring, as does an ordinary clock. Two small cells of battery are placed in the top of the case, connected with a magnet secured to the lower part of the movement. As the centre wheel, driven by the unwinding of the spring advances, a lever is raised that unlocks the armature and allows it to spring back into position ready for winding. When the lever drops, the circuit is instantly closed, the spring being wound by the pawl fastened to the armature. The action of winding breaks the circuit when the winding is completed. The contacts are made so short that the action of the battery is very slight, thus enabling it to perform the work of winding for over a year without renewal or alteration. Each clock is provided with a simple attachment by means of which its hands may be controlled automatically by electricity. To secure absolute uniformity of time throughout the city, the clocks will be connected with a time wire just before twelve o'clock each day. During the brief period of connection the standard clock at Washington through the repeating lines takes possession of the wire, temporarily controlling all clocks in its circuit.

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A Clock Fires the Noonday Gun. As Halifax, Nova Scotia, is a British military and naval station, a signal gun is fired from the citadel each day at noon, and at 9.30 p.m. The time has always been supplied by Robert H. Cogswell, jeweller. Twenty years ago the sergeant in charge of the gun daily regulated his watch at Mr. Cogswell's store. Several years ago this plan was discontinued, and a flag signal system was adopted. This in turn was succeeded by a time ball signal system. A short time ago, on account of the frequent interference with the signals by fog, a new arrangement for firing the gun was perfected. A cable has been laid from Mr. Cogswell's establishment to the citadel, and this is connected with a clock which automatically fires the gun. The dial of the astronomical clock bears two small receptacles containing mercury. One of these is so placed that the reverse end of the second hand will touch the mercury when the index end points to the sixtieth second. Each end of the minute hand touches the mercury in the other receptacle, one end at the hour, and the other at the half hour. When the minute hand touches the mercury in one receptacle, and the second hand touches it in the other, the circuit is completed, and the cannon is discharged by an electric current passing through the clock. The military authorities at the citadel are able by means of a switchboard to cut the gun out of the circuit, connecting it only a few minutes before the firing is to be done.

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Imports of Watches. THE Board of Trade returns for October show that the value of watches and parts thereof imported during the month was £57,408, an increase of £4,061, as compared with the same month last year, when the figures were £53,347, and an increase of £7,528 compared with October, 1888, when the value was £49,880. The total imports of watches and parts of watches for the ten months ending October 31, 1890, amounted to £580,888, being an increase of £12,257 over the same period of 1889, when the value was £568,631, and an increase of £84,863 over the ten months of 1888, when they amounted to £496,025.

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A Watch made of Quartz.

A unique watch, said to be the only one of its kind in the world, is in the possession of R. A. Kettle, manager of the American Waltham Watch Company, in Chicago. The cog bridge, the lower plate, and the case are carved out of perfectly transparent quartz, hard as adamant. All there is in the watch that is not made of this clear crystal is the upper plate—of brass—and the running gear, which necessarily must be of metal. This watch is valued at $5,000. It is small sized, a stem-winder, has been in possession of its present owner a year, and is an excellent timekeeper. This masterpiece of the horological art is the work of George R. Wills, of Waltham, Mass., who worked on it at odd moments for two years. In the factory at Waltham he held the position of superintendent of the jewel department. The case of the watch is a solid piece of quartz, ground down to the size to accommodate the movement. The jewels belonging to this movement are set into the crystal, and this task was one of peculiar difficulty and delicacy. The holes which were to hold the jewels had to be bored beforehand, and their size had, of course, to be gauged very accurately. This done, the plate of crystal was heated over a spirit lamp sufficiently for the heat to enlarge the holes a trifle, but enough to drop the jewels into them. The quartz again cooling off, it held the jewels firmly. During the process of doing this two plates and ten jewels were broken until the experiment finally succeeded in every respect. "The question has often been asked me, 'How was the movement put into the case?'" said Mr. Kettle, the owner. "The answer is this: The case is an open-faced one, and the movement is dropped in from the front, after which the dial, hands, and glass bezel are fitted. The movement is pendant winding and pendant setting." Mr. Kettle has at present in the process of making an upper plate of crystal and a gold skeleton dial, to be put into this remarkable watch, so as to make the entire watch transparent and show the action of the running gear. This is done to show the perfection attained in the science of American watchmaking.

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An Antique English Watch.

An ancient silver timepiece, valuable for its historical associations no less than for its antiquity, is owned by Daniel Minthorn, of Watertown, N.Y. Its weighs 5¼ ounces and is 250 years old, and it keeps good time when wound, although it has not been repaired since 1847. The watch is of the pattern known as the "British bullseye," and is 1½ inches thick. The face is of silver, roughly chased, and has a double row of figures—Arabic and Roman numerals. It bears this mark: "Thomas Linhard, London, 110." A search through ancient directories of the city of London, made by Mr. Minthorn at the last London Exhibition, revealed the fact that this jeweller was in business in Fleet-street between the years 1638 and 1658. This cumbrous timepiece was once worn within the buckskin coat of the celebrated Mohawk war chief, Joseph Brant, whose Indian name was Thayendanega, and regarding whose accomplishments as a warrior, chief, and courtier many legends are related in Western New York and Canada.

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A travelling watchmaker named Albert Bates, who had been in business 15 years at Stonehouse, has gone to prison for six weeks at Devonport for stealing a silver watch and gold chain entrusted to him for repair.

Sheffield Notes.

(From our Correspondent.)*

The Sheffield members of the Iron and Steel Institute have returned to their homes, and their impressions of America are now public property. There is a monotonous sameness about the tale they each and all have to tell. In the first place, they express themselves as delighted with the cordiality of their reception. Their admiration of the enterprise of American manufacturers, and of the general prosperity prevailing in the States, is unbounded. They note that the American working man is very much superior to his British brother—being better clothed and better behaved. He, moreover, works longer hours, and is much more to be depended upon. Their reports, generally, give the impression that America is a sort of manufacturer's Paradise, and yet they are one and all glad to get home again. America may be a good place to make money, but in their opinion England is the place to enjoy it.

Their ideas as to the probable effect of the M'Kinley tariff are no less interesting. Certain branches of Sheffield trade, they say, will be utterly destroyed, and nothing remains but for those concerned to transfer themselves bodily to the States. This is cold comfort. These are not the opinions of croakers, but of some of the most clear-headed and enterprising of Sheffield's sons. And yet they may be wrong. Prophecies of this sort have before now been falsified by the event. A case in point, dating back to the period when the United States first adopted the principle of protection, may be cited. At that time the bulk of the trade of Messrs. James Dixon and Sons was American trade. It was confidently anticipated by many that that firm, then one of the largest electro-plate concerns in the town, would have to shut up shop. Not only, however, was this not the case, but their growth, although they certainly lost their American trade, was not materially arrested.

At all events, silversmiths will not be directly affected by the M'Kinley tariff, as they have long since ceased to do any appreciable amount of trade with the United States. If they suffer ultimately it will be in sympathy with other trades. This will help to keep alive our interest in the fiscal policy of America, which might otherwise flag if we looked only to the present.

The extension of premises mentioned in these notes some months ago as being contemplated by Messrs. Mappin and Webb is now taking definite shape. The demolition of the offices fronting Norfolk-street is now complete, exposing to view the fact that building operations have been for some time steadily going on in the rear. Blocks of workshops, extending as far back as Eyre-lane, are rapidly approaching completion. That portion of the site just cleared will be occupied by the new show-room, which it is the intention of the firm to make one of the best appointed in the town. Although no steps have as yet been taken in the matter, I hear that it is quite probable that this portion of the new premises will be fitted up with the electric light. If this is not done the show-rooms and offices of Mappin and Webb will only prove a bad second to those of John Round and Son. When the building operations now in progress are completed, the working capacity of the manufactory will be more than doubled.

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IN these days of ivory famine, a recent visit which I paid to the works of Messrs. John Merrill and Co., of Holly-street, afforded me an agreeable surprise. I was shown a splendid lot of tusks, each measuring about 12 feet in length. An attempt which I made to lift one was an operation I did not care to repeat. The weight of the whole went into the tons, and the lot was in first-rate condition. One remarkable looking tusk was as black as jet, but on being scraped with a penknife it was found to be of the purest white. Some of these weather-stained specimens are said very often to turn out the best, their peculiar appearance being caused by lying exposed to the atmosphere for lengthened periods in some African forest.

A TELEPHONE pole is not generally considered a thing of beauty. Most people, however, are satisfied if they can keep the obnoxious thing out of their own backyard. Mr. Fred Sybray goes farther than this. His early School of Art training has perhaps made him more than usually sensitive. Be this as it may, he objects to anything of the sort in the moorland village of Dore, whither he retires when the labours of the day are ended. The other day a foreman of the Sheffield Telephone Exchange and Electric Light Company, presuming on a certain friendliness subsisting between Mr. Sybray and that company, erected a pole near the confines of the village, his intention being to run the rest of the distance underground. A concession was made to Mr. Sybray's susceptibilities, inasmuch as the pole was not an ordinary pole, but a fine tall smoothly planed pine tree, with an ornamental finial. Mr. Sybray saw the thing on his way into town, and the result was a letter to the secretary of the company, in which the attempt at ornamentation way characterised in scathing terms. I am afraid the feelings of that foreman were hurt; but the cause of æstheticism, as championed by Mr. Sybray, ultimately prevailed, and the pole was pulled down.

SILVERSMITHS expect to be busy at this time of the year. But to say that trade is good just now is to use a very mild term indeed. The manager of one of the largest concerns in the town told me the other day that he had never in all his experience, and it was not a short one, known trade so brisk. Messrs. Round and Son have orders enough on hand to keep the spoon and fork department fully employed to the end of January. The hollow-ware department of the same firm is nearly as well off. Manufacturers have the greatest difficulty in procuring sufficient men to keep pace with the requirements of their customers. Everything points to a glorious Christmastide of the good old-fashioned sort, and the ancient institution of "Bull-Week" is likely to be as much honoured this year as Her Majesty's Inspectors of Factories will permit.

IT is satisfactory to note, too, that the present state of prosperity in the silver trade is no mere spurt. Last year at this time trade was good, and we should all have been perfectly satisfied to be doing the same amount of business this year. The fates, however, have decreed that our cup this year should be not only full, but running over. The evidence that the volume of trade has been steadily growing is seen in the state of the manufactories, where in nearly every case extensions and improvements seem to be in progress. The case of Mappin and Webb has already been noted. They are not, however, by any means singular in this respect. It will be news to most people, even in Sheffield, that Messrs. John Round and Son, Limited, are making most extensive additions to their present premises. The new buildings cannot at present be seen from any of the streets by which the works are surrounded, but it only requires the demolition of a row of shops in Norfolk-street to expose to view ranges of new workshops forming three sides of a square. The fourth side, which if it be built, must of necessity front into Norfolk-street, rumour has it, is to be the site of a new show-room. Of this however, as Mr. Ridge keeps his own counsel, nothing can at present be said with certainty.

I QUESTION very much whether people outside Sheffield have any idea of the extent of these hives of industry, which we call our electro-plate manufactories. John Round and Son employ about 600 workpeople, and James Dixon and Sons, of Cornish-place, probably a few hundreds more. This latter firm have organised from among their active and intelligent artisans a volunteer Fire Brigade, which has just done yeoman service in the case of a fire which broke out in a large works in their immediate neighbourhood. The damage done would have been much more extensive had it not been for the exertions of the silversmiths, who will probably not complain that the utility of their organisation has been demonstrated on other than their own workshops.

THE demolition of the buildings on the site of the new Town Hall is nearly complete. We are thus within measurable distance of having the whole of the municipal offices centred at the end of Pinetone-street, which will to a large extent shift the centre of gravity to that place. This will bring the business part of the town close to a very important silversmiths' district, which cannot fail to be not only a source of profit to the numerous show-rooms in the neighbourhood, but a great convenience to business men from a distance.

LONDON WATCHMAKERS' TRADE ASSOCIATION.

THE fourth annual general meeting of this Association was held on November 5th, at the Martyrs' Memorial School-room, Clerkenwell, Mr. James Rowlands, M.P., being in the chair, and there being a fairly numerous attendance of members.

The Chairman pointed out with regard to the present position of trade in London, that, though something had been done during the past few years, he did not think that those who were conversant with the matter were satisfied that all had been done that might have been done for the improvement of their industry. To his mind the great difficulty had been that, up to within the last few years, there had always been a very large amount of reticence on the part of those engaged in the watch trade in co-operating with regard to the condition of the industry, and in taking anything like united action on any particular point. Those of them who were in the trade in years gone by were, no doubt, to blame for this; and he thought that those who had at last taken action in the matter were already somewhat satisfied by the benefit that had accrued from it. The first point which must arise in the minds of all those present was the position which they had got exceptionally as a trade in the Merchandise Marks Act. A weakness in that Act was that whilst certain things were defined as fraudulent, instead of the proper authority being brought into existence to put the law into force, it was left to the efforts of a few voluntary associations to carry its provisions into force. When they considered the present position of the trade in London, they could not help feeling how terribly this burden fell upon them. Fortunately there was hope that they would get through Parliament a short Bill dealing with the question of prosecutions. He had only one other matter to allude to, and that was the present plate licence, for which he could see no justification; and he had yet to find out that there was any reason why a man who wanted to sell an English watch, and required a short licence, should have to pay £2 6s. per annum—which for a small man was a large sum—whereas a large man could get a long licence for £5 15s. If ever he got an opportunity he should vote for the abolition of licences.

The annual report, which contained references to the great watch trade conference of last spring, and to the prosecution of a Cheapside house (Hyland) for selling a watch with a false trade description, and in which regret was expressed that many members took but little interest in the progress of the Association, was adopted. Messrs. E. Jones, F. Montague, J. G. Lee, Myart, Bingham, Moore, and Briggs were elected as committee-men, and the auditors, Messrs. Melvill and Andrews, were also re-elected. Mr. S. A. Brooks, the retiring chairman of the committee, was elected a vice-president of the Association, and it was decided that he should be presented with an address to be paid for by private contributions. A letter was read from the Coventry Watch Trade Association, enclosing a donation of £5 5s., voted by the committee towards the recent prosecution of Hyland. The letter added, "Our committee regret that they are unable at present to send a larger donation, but hope to soon be in a better position, so as to enable them to vote larger amounts in cases of such utility as the recent prosecution has been to the trade generally." A further donation of £5 was also received from the Prescot Watch Association.

On reaching the item on the agenda headed "General Bsuiness," some discussion took place on "Wycherley" movements. The secretary afterwards called attention to the case they had had before the Clerkenwell Police Court, on October 22nd, in which a man was charged with selling a foreign watch, which he said was foreign, because he had his name and address upon it and an English case. They prosecuted him, and he was sorry to say the penalty was only £1 1s. costs and 5s. fine. Since then he had heard that a large tradesman, who had several thousands of watches in stock, had set about having every one marked in the case. It was suggested that he (the secretary) should wait upon this man and put him right in the re-marking, as it was not the intention of the Association to press the matter harshly upon anyone.

Votes of thanks concluded the proceedings.

GOLDSMITHS' AND JEWELLERS' INSTITUTION.

The large hall of the Goldsmiths' Company was well filled by the supporters and friends of the Goldsmiths' and Jewellers' Annuity and Asylum Institution, on November 24th, the occasion being the twenty-third annual dinner of the institution, over which the Lord Mayor presided.

The loyal and patriotic toasts having been honoured with customary enthusiasm, the Lord Mayor proposed the toast of the evening, "Prosperity to the Goldsmiths' and Jewellers' Annuity and Asylum Institution." He rejoiced, he said, to see that noble hall so well filled by gentlemen whose object was to promote the wellfare of their fellow-creatures. The institution was founded sixty-three years ago, and its object was to give to every incapacitated or aged workman or his widow an annuity to provide for them in times of sickness or old age. The pension awarded to male annuitants was £15, and to female annuitants £10 per year. The committee earnestly wished that the amounts were larger, but there were so many applicants, and the funds had been so greatly restricted, that the committee had thought it well to spread the benefits of the institution over the many rather than restrict it to the few. At the present time there were many cases which the committee would be only too glad to relieve if it were in their power to do so, but the want of funds prevented them, and the institution was to a great extent, in aid of self-help. The rules of the society provided that each annuitant should have subscribed to the funds for five years a minimum amount of 5s. a year, and the five annual subscriptions of any of the annuitants might have been contributed during a period of thirty years. In this way the principle of self-help was recognised. In the year 1828, one year after the foundation, there were only two annuitants, and at the present time there were 78, and it was hoped by this festival to increase the number to 100. Another advantage attached to the institution was the asylum, by means of which those subscribers who were without a home were provided with one. That asylum was filled to-day, containing as it did 19 inmates. But it was in their power to increase its accommodation. The number of subscribers in 1827 was 200. That number had now increased to 1,317, but more subscribers were still needed. A pleasant feature of the institution was that it was managed most ably and most successfully by a committee of working men, who deserved the thanks of the trade generally for the efforts which they were making to relieve the distress of their fellow-creatures. (Cheers.)—The toast was enthusiastically drunk.

Major Lambert proposed "The health of the Lord Mayor." He said that, if he were rightly informed, it was at his Lordship's instigation that the members of the society were permitted to hold that, their twenty-third annual dinner, in that hall. Alluding to the Lord Mayor's statement, that the male annuitants received £15 and the female annuitants £10 per year, he pointed out that all in receipt of such relief were not debarred from obtaining grants and annuities from the other societies connected with their craft, of which there were altogether some five or six. He warmly thanked the Lord Mayor for his presidency that evening.

The Lord Mayor, in response, said that when he accepted the post of Chief Magistrate he determined to do all that he possibly could for the benefit of the trade societies connected with the craft, and he felt sure that the craft would rally round one of their members, whoever he might be, who happened to have the honour bestowed upon him of being Lord Mayor of the first City in the world, and in that surmise he was correct. Although he was actually the fifteenth Goldsmith who had been Lord Mayor, he believed that within the last century there had only been one or two members of the craft who had attained to the dignity of Chief Magistrate of the City.

Subsequently the Lord Mayor, in proposing "The Goldsmiths' Company," said that company not only gave £500 a year to the institution, and similar amounts to other institutions connected with the trade, but during the past five years it had been a benefactor to that institution to the extent of £1,746. In coupling the name of Mr. F. B. Thomas with the toast, he said the institution was deeply indebted to that gentleman for the efforts which he had made on its behalf at the Court of the company, and for his able advocacy of its claims for many years past.

Mr. Thomas, in response, said the institution was engaged in one of the noblest works that any institution could undertake.

The Lord Mayor, again rising, proposed "The Health of the President and Trustees of the Institution." In a few well-chosen words he pointed to the charitable nature of their president, and referred to the special efforts which he had put forward to make the institution a success. He had, concluded the Lord Mayor, the cause of charity deeply rooted in his heart, and he had an especially tender heart for distressed members of his own craft.

Major Lambert, in acknowledging the compliment, again impressed upon his hearers the need which existed for more subscribers, and, in conclusion, warmly thanked those who had done duty as shop collectors, and who each week collected small sums in aid of the institution's funds.

During the evening the Secretary announced subscriptions amounting to £546, including a donation of 20 guineas from the Lord Mayor, and a life subscription of 100 guineas from Major Lambert.

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

The Hexagonal System (Continued from page 106.)

Natural Forms of Ruby and Sapphire.

THE ruby, sapphire, oriental topaz, and oriental amethyst, together with an infinite number of other hued sapphires, as well as the principal asteria, are all members of one genus, the corundum. It would be infinitely better if we were to regard all the reds and pinks as rubies and pink-rubies, and all the other hues as sapphires and tinted sapphires, whether purple, or yellow, or any other hue. As it is, one is never certain what is meant by an oriental amethyst. An oriental amethyst, it is argued, is an amethyst that comes from an oriental country; it thus confuses the ordinary purple quartz with the purple sapphire. The same may be said about the topazes. I therefore use the terms in their distinctive sense, and speak of the sapphires according to their hue; when no hue name is used, the sapphire is understood to be blue. The crystalline forms of the corundums are very simple, as a rule, colour making no difference; they are generally doubly terminated hexagonal pyramids (Fig. 14). The sides are often fairly smooth, especially in some sapphires. Some now before me are as bright as they ever would be if polished; usually they are rather striated at right angles to their lengths, and in the larger and coarser varieties they often become a little rough.

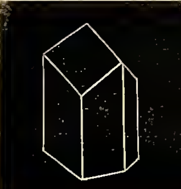


FIG 13

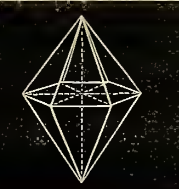


FIG 14

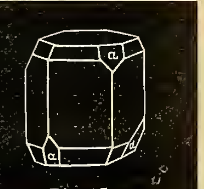


FIG 15

In the hexagonal system there are four axes—three lateral, and lying all in the same plane, and a fourth which is vertical. The vertical axis joins the apices of the double pyramids or centres of the upper and lower face of the prism, as shown in Fig. 14. The lateral axes may join the centres of each face or edge at the girdle, or they may join the opposite angles. In the first instance they are called "of the first-order," in the other "of the second order." If no other faces were ever put on except those shown in the Figs. 13 and 14, we need not have troubled about this second order but unfortunately they are, as shown in Fig. 15. If we hold a hexagonal prism so that its parallel sides run directly from us, we shall notice the two nearer ones point towards us, the two distant ones from us. Now, the principal distortion that I have noticed in crystals of corundum, especially Ceylon and Indian sapphires, is that there is often a tendency for these two parallel sides to approach, making the distance between the distant points of the other two pairs much further than they should be, and their faces much smaller than those of the other two: whilst the converse also occurs very variedly, so that the two parallel sides are sometimes very much reduced in proportion; indeed, examples of this phenomena lie before me, where they are hardly visible with the naked eye, the prism looking as though it were built up upon a rhombic base. It was this phenomena in crystallisation that originated the four rayed star-ruby we described in an early part of these articles. Although this perfect pyramid rises at the angle shown in Fig. 13, more often, by far, it rises in a curved line, and sometimes in steps of various angularities. Occasionally, too, a tapering prism may end in a low three-side termination, the faces being those of a rhombohedron; or, as an extreme to that, a prism may go on with parallel sides, but at one angle there will be put on a long pyramidal face which will gradually widen out as it rises, cutting through the faces on either side, as though one had been trying to make a wedge from it. Sometimes a pyramid is truncated by the putting on of a basal face, or face at right angles to the length of the prism. Sometimes, also, a prism of the first order may be followed by a pyramid of the second order, in which case the faces of the pyramid are not in a line continuous with the faces of the prism, but lie immediately over their angles, as we see in Fig. 15. It will here be noticed that the putting on of these faces upon truncated forms gives them the appearance of barrels; and when faces occurring in a number of steps—or zones, as they are more properly called when they all lie in the same plane—are present, the form really does become that of a barrel. It will also be noticed that these faces are alternately not only along the horizontal plane, but along the vertical also. Often these pyramidal faces meet in the centre at an edge. This form is usually, or at least very often, assumed by the Burmah rubies; several such lie now before me. I have seen a number of these together, sometimes, and not an ordinary hexagonal prism amongst them. Fig. 13 shows a hexagonal prism, but the pyramidal top is only three-faced. It is the hemihedral form, only half the planes being developed. It is, in fact, a rhombohedral termination to the prism. The faces might be those of the cleavage, as corundums have the remarkable property of cleaving both basal, and in the planes of the rhombohedron: but of this we shall speak more fully when we come to the physical properties of gems.

With the asteria, so far as I have observed, they are always prisms, usually truncated by the basal plane along the line of cleavage; their crystalline outline is similar to the ordinary sapphire, but their structure is altogether different, being composed of composite fibrous striated crystals, which run parallel with the sides of the prism, whilst their molecular structure adds further to their complexity. The several phenomena presented by star stones cut at various heights, and the angle through which the star moves, have never been mathematically studied. We do not, so far as my experience goes, find that gradual passage as we do in the cymophanes where the delicate suspicions of silkiness first appear in so faint and slender a form that only by a strong glass under the most favourable light are they visible, although silky rubies and sapphires do occur, of course; but the structure is always, to my vision, more pronounced.

(*To be continued.*)

CASES OF FALSE DESCRIPTION.

THE case in which Messrs. Evans, manufacturing goldsmiths, of Northampton-street, Birmingham, were charged, as reported last month, summoned by Messrs. Blanckensee and Co. (Ld.), jewellers and factors, for selling three bracelets to which a false trade description had been applied, and also for applying a false trade description to three bracelets, has resulted in the infliction of a fine on one of the defendants, Mr. Evans, sen., it being proved that the son took no part in the business. It was urged in extenuation of the offence that the bracelet branch of Mr. Evans's business was a new one, under separate management, and that the manager had full discretionary power as to the mixtures and solders. Also it was stated that inside soldering with silver solder was a common usage in the trade, though not as applied to hall-marked goods. Taking all the circumstances into account, and especially the fact that the defendant had hitherto borne an irreproachable character, and was generally respected by the members of his trade, the magistrates decided that the justice of the case would be met by a substantial pecuniary fine, and they accordingly inflicted upon the defendant a penalty of £10, and costs.

Another case of false jewellery was last month before the Birmingham magistrates, William Cook, of Hockley Hill, being charged by the Assay authorities with selling base metal falsely marked as 9 carat gold. It was stated that the defendant represented himself as a manufacturer of jewellery, and in 1876 registered his name to the authorities at Birmingham, to whom he from time to time sent articles to be stamped. The articles were examined and returned in the ordinary course, but for the last few years he had not sent anything to be assayed. In 1887 the defendant called upon Mr. Wilkinson, jeweller, of Bradford, and sold him some goods. In the following year he called again, and showed amongst other things three dozen gem rings, which were marked on the inner lining with the stamp of the Birmingham authorities. Mr. Wilkinson purchased the rings for 36s. per dozen, with a deduction of 5 per cent. for cash. The defendant told him that he was selling the goods on commission, or he could not have disposed of them so cheaply. It was found that the rings were not as represented. The case was adjourned until the 28th ult.

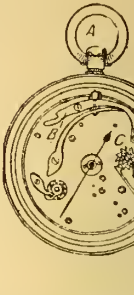
The London Clock and Watchmakers' Protection Association have prosecuted Edward Clarke, watchmaker, of 148, Upper-street, Islington, for having applied a false trade description to a foreign made watch sold by him. The watch was Swiss made, but was stamped with the English hall mark, the defendant observing when he sold it that "It was none the worse for being a Geneva watch." Mr. Clarke's defence was that the watch was made a year before the Marks Act was passed, and was the only one he had in stock. A fine of 5s. and a guinea costs was imposed.

ILLUSTRATED INVENTIONS RECORD.

Universal Time Indicator.—J. W. Mason, 2, Comiston-road, South-side, Edinburgh.

A map of the world laid out on a circle, having the North Pole as centre, is rotated by clockwork or set by hands upon a clock dial.

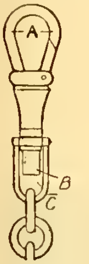
Stopwatch.—R. Fennell, 2, Mount-street, Chapel-fields, Coventry.



A key-winding centre seconds watch is stopped and started from the pendant. The pusher A acts on a spring driver B, which advances a wheel C of twelve teeth bearing six studs. A curved spring D has a tooth which presses against the studs, and a pin which stops the escapement roller when the tooth falls between the studs.

Pencil Holders.—L. G. Sloan, 2, Long-lane, London.

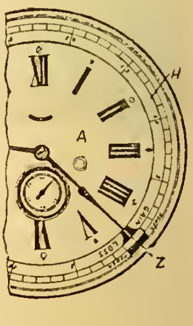
Relates to that class of holders in which a cedar pencil is secured in a sheath or socket which slides within a tubular holder. To more securely hold the pencil it is provided with a cap having a screw thread by which it is screwed into the sheath. The cap is secured to the pencil by burning on, or other suitable means.



Swivel and Watch Key.—J. Ashwin, 24, Spencer-street, Birmingham.

The swivel hook A, for connecting a watch and chain, is combined with a watch key B and a universal shackle C.

Speed Indicator.—A. R. Sherman, Pawtucket, Rhode Island, U.S.A.



A clock dial A is surrounded by a rotatable ring H graduated in opposite directions from a zero point Z. This ring is driven from the engine or machine observed, through worm or spur gear and a ratchet with adjustable stroke. At the normal speed the ring rotates synchronously with the minute hand, but any change of speed is indicated by the angular separation of the clock hand and ring zero.

FIG. 2.

FIG. 4.

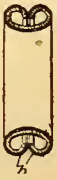
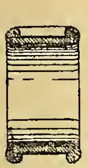


FIG. 6.

Jewellery.—G. H. Knight, 14, Fountain-street, Providence, Rhode Island, U.S.A.

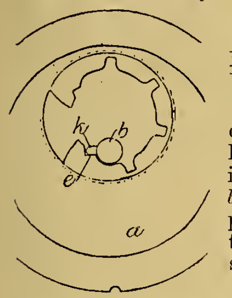
Plated ornamental rings formed from plated seamless tubes by turning their ends *b*, Fig. 2, outwardly, Fig. 4, or inwardly until they meet each other, and then flattening the two parts together as shown in Fig. 6. Two such tubes, one within the other, may also be employed.

Jewellery.—G. H. Knight, 14, Fountain-street, Providence, Rhode Island, U.S.A.



Plated ornamental rings formed from seamless tubes with plated outer and inner surfaces, by bending the edges outwardly and backward, as shown in the drawing, so as to entirely conceal the base metal. Two such tubes, one within the other, may also be employed.

Clocks and Watches.—R. Radlanski, Zaborze, near Zabreze, Upper Silesia.



Overwinding, preventing.—The coverplate *a* of the barrel has a loose annular notched wheel *e*, let in eccentrically round the arbor *b*, and the latter has an engaging pin *k* which, in winding, turns the notched wheel till stopped by a shoulder *e*.

Pencil Holders.—E. Wehrli, Aarau, Switzerland; and E. Bally, Schoenenwerd, near Aarau, Switzerland.

The holders are arranged to receive short lengths of pencil. Figs. 1, 3 and 4 show one form of holder. It consists of two tubes, the inner h^3 (Fig. 4) and an outer h^2 (Fig. 3). The latter is slightly conical, being smaller at the lower part. The upper part of the outer tube is slit, so forming tongues, three of which are bent inwards. The inner tube h^3 is slotted at the upper part to correspond with the outer tube, and is also slit at the bottom, the tongues so formed gripping the lead when they are pressed together. The tubes are placed together and a lead dropped in. On pulling the outer tube over the inner the lead is clipped as shown, but if it is pushed forward, the pencil being inverted, the slit end opens and the lead falls within, and is held there by the tongues formed in the upper part of the tube. The bent tongues on the outer tube serve to hold a piece of erasing material. The relative motion of the tubes is limited by a pin *n* sliding in a slot in the inner tube. In modified forms the arrangement of tongues at the upper part is dispensed with, and in a further modification a single slit or elastic tube is employed to hold the lead.

FIG 4

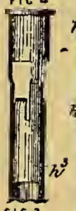


FIG. 1.

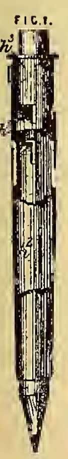
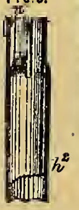


FIG. 3.



APPLICATIONS FOR PATENTS.

(*This List has been specially compiled for the* Watchmaker, Jeweller and Silversmith *by* Messrs. W. P. Thompson and Boult, of 323, High Holborn, London, W.C.; 6, Lord-street, Liverpool; 6, Bank-street, Manchester; and 63, Long-row West, Nottingham.)

16,681.—R. A. H. Allen, Brondesbury, for "The safe carrying of a watch for bicycle riders, to be locked on to the handle of the bicycle." Dated 20th October, 1890.

16,814.—R. A. Green, London, for "A new and improved watch case for dressing tables and the like." Dated 22nd October, 1890.

17,010.—J. A. Lund, London, for "A new or improved timepiece compass." Dated 24th October, 1890.

17,243.—F. Edmonds, London, for "Improvements in pencil cases." Dated 28th October, 1890.

17,437.—C. Bachem, London, for "Improvements in safety fastenings for scarf pins and brooches" (complete specification). Dated 31st October, 1890.

17,620.—A. E. J. Ball, London, for "An improved safety brooch catch." Dated 3rd November, 1890.

17,788.—A. G. Brookes, "A communication from the firm of H. Drews, Germany, for." 5th November, 1890.

18,218.—F. L. Turner, Birmingham, for "Improvements in watch cases." Dated 12th November, 1890.

18,235.—W. D. Bohm, London, for "Improvements in the separation of gold and silver from ores or materials containing them." Dated 12th November, 1890.

18,344.—G. H. Row, Redhill, for "Improvements in protectors for purses and portemonnaies." Dated 14th November, 1890.

THE MARKETS.

NOVEMBER has gone—so let it go. On few occasions in our life have we been nearer a crisis than day by day threatened us at its commencement, and had that crisis come it would have been most disastrous to our Christmas trade. The conditions of a crisis were all there, and on any of those mornings in the early days of November a single indiscreet action in a certain quarter which regulates the financial state of the country, would have cut the hair by which the sword was suspended; but instead of disaster we have something else to reflect upon—viz., that when conditions and emergencies such as these arise, we have men at the head of our affairs who can guide us through them and ward off the threatened danger. Naturally, with such an uncertainty in the market and such various rumours, the price of silver has suffered—sometimes up, sometimes down. At the time of going to press it is down to 47d.

THE DIAMOND MARKET.

Amsterdam.—At the close of October, large stones of a carat and upward were still in demand, which continued during the first half of last month, when several nasty rumours of failures had a slight effect, not so much business being transacted, although prices were maintained. It is stated that buyers do not take kindly to the modern advances, but these are inevitable, so long as the price of rough remains, which have been sought after during the whole month, though perhaps a little less eagerly during the last week.

Paris.—The state of the markets in Paris has been very similar to that of Amsterdam, with more manufacturing, however, for the new year's trade, and occasionally more speculation on the part of buyers. The steamer *Gascoyne* took away to New York 71 parcels of diamonds and 25 parcels of pearls.

London.—There have been four arrivals of diamonds from the Cape during the month, and although the supply has been rather above the average, and buyers have tried to withhold buying, prices have remained about the same. £7 and £8 has now got to be recognised as the price for good mellee, while the higher weights are regulated by the demand for them.

* * *

In the City of London Court, Messrs. Spaull and Johnson, jewellers, of Ludgate-hill, sought to recover £3 12s., the balance of an account for jewellery supplied to Mr. W. Martingale, who set up the plea of infancy. One of the plaintiffs said the defendant was in business on his own account, and had a separate estate. Mr. Commissioner Kerr said that was very likely, but the defendant was not liable for the jewellery he bought until he was twenty-one years of age. He could not say that jewellery was "necessaries." He was bound to find for the defendant. Asked for costs, Mr. Commissioner Kerr said: Not one farthing. You have cheated the plaintiffs out of their jewellery.

From Across the Atlantic.

Heavy and Unexpected Failures.

THE diamond trade of New York has recently been more than surprised by the announcement of the smash of D. H. Wickham and Co., of Maiden Lane; the more so as this was looked upon as one of the pillars of the trade, Mr. Wickham having served in the high capacity of Mayor of New York, and, according to some accounts of his friends, started in business on $75,000. According to the American bankruptcy law, preference was given to John Munroe and Co., as prior claim. What that is, is not stated, but by the same law the creditors can only put in for one-third the entire estate. Amongst the numerous creditors we notice the names of many well known in Hatton Garden and Paris. The liabilities are stated to be little short of a quarter million dollars.

The Success of Modern Businesses.

AS everybody is aware, the city of millionaires—Chicago—is employing every effort to make the great International Exhibition, or, as they prefer to call it, the World's Fair, the largest thing on record. However, one English firm at least means even outdoing the Exhibition itself, and announce that their show is to be unsurpassable. Judging from their having given a large Chicago firm *carte blanche* in the erection of the cabinet work, we think it may possibly be their intention of doing so, especially when we become conscious of the fact that the firm mentioned is none other than the Goldsmiths' and Silversmiths' Company, of Regent Street. Such an exhibition would only naturally follow in the wake of what they have done and are doing.

Pearl Fishing in the States.

PEARL fishing goes on merrily in some of the rivers in the United States. The pearl fishers in the Miami river, Ohio, have been very successful. Similar reports come from Indiana, and in Wisconsin a perfect pearl craze seems to prevail. A report from Chilton says:—

> "The gems have been discovered in the north and south branches of the Manitowoc, the Killsnake and Mud Creek, besides numerous small lakes which lie in the county of Calumet. The water is very clear, and comes mostly from springs, which are quite numerous in this county. The bottoms of these streams are sandy and full of gravel, and embedded in this grave are millions of clams. Out of two or three varieties of these the pearl-producing clams are found, and the number of pearls found in a single clam average from one to fifty. A trip down the river about four miles on a pleasant day shows hundreds of men, women, and children at work. The men and boys, with baskets in their hands, dig the clams out of the bed of the river and carry them to the shore, where the women and girls open the shells and take out the gems. Farmers with wagons drive to the river, and with shovels fill their wagon boxes and drive home. The excitement along the river is great."

Similar statements come from other localities, and there seems to be some danger that some of the varieties of pearl-bearing clams will become extinct, on account of the destruction now going on. In some of the Milwaukee jewellers' shops are some magnificent displays of Wisconsin pearls. One is stated to be "as large as a gooseberry," and worth a thousand pounds.

Ticketing in Windows.

AN American contemporary, commenting upon the wisdom of the above, says it is open to dispute, and adds:—It draws the attention of the purchaser too much to the mere price of the articles, and incites his curiosity to investigate further. He sets out price-hunting, visiting store after store, and airing his knowledge of the subject. Jeweller No. 2 is thrown into a panic by his well-posted visitor, and thinks his only salvation lies in underselling his competitor. He cuts the price, and the consequence of this foolish policy is ultimately to wipe out the profit on the article so ticketed, and black-list it for the whole local trade. It may be set down as a rule that the continual quoting of prices, and comparison of the same with those of other dealers or other makes, which many storekeepers thoughtlessly indulge in, is a mistake. *The salesman should rather bend his energies to impress the intending purchaser with the beauty and merits of his wares, rather than their cheapness.* Price is a secondary consideration. Let the window display be made to please the sense of the passer-by, rather than to instruct him in prices.

While there is much in this with which we fully agree, especially that which we have put in italics, we still believe that ticketing sells, irrespective of the price marked.

New Tariff Rates.

THE revised United States tariff schedule does not affect the jewellery and kindred trades to any great extent. The increase of the duty on jewellery to 50 per cent., whilst regarded as an unnecessary measure, is likely to work little hardship to any branch of the trade. The greatest source of confusion thus far is found in the varying duties levied upon imported clocks, which are assessed at from 30 to 60 per cent., according to the material of which the cases are made. The duty is now advanced on clock movements of brass and steel to 45 per cent., and on cases manufactured of marble or onyx to 50 per cent. Cuckoo clocks and regulators are rated under the metal schedule, now 45 per cent. French clocks of marble or onyx cost about 15 per cent. more than they did before the increase; for a clock the value of 10 dols., with the addition of the old tariff of 30 per cent., would cost 13 dols., but now, with a tariff of 50 per cent., it will come to 15 dols. The tariff on bronzes has advanced from 30 to 45 per cent., and on bronzes with porcelain mountings from 30 to 60 per cent. In consequence of this confusion, prices have been much shaken; but a tendency towards advance has already shown itself, with the prospect of prices ruling from 10 to 20 per cent. higher.

A Remarkable Announcement.

"A REWARD of $1,000 will be paid by Hamilton and Hamilton, jun., the renowned chain makers, to the man who will prove that any of the firm's goods can be returned to them at the end of the season."—*From an American Advertisement.*

New Hairspring Collet.

A PATENT has just been taken out in Springfield, Ohio, for "a watch hairspring collet, constructed with an incision in one face, which runs eccentric to the periphery, and is adapted to receive and hold a hairspring."

SILVERSMITHS' AND JEWELLERS' CRICKET CLUB.

A VERY successful smoking concert under the direction of Mr. Jas. Kift, and presided over by Mr. J. M. Garrard, of the Haymarket, was held at the Freemasons' Tavern, W.C., in connection with the above club, on the 17th ult. This was the first concert given by the club, and about 500 were present. The programme was excellently rendered throughout, and was received with enthusiasm and frequent encore. In the course of the evening Mr. C. J. Hill, jun. (who was received with applause), proposed a vote of thanks to the chairman, who he said had taken great interest in the affair, and to whom was largely due the success of the evening. Mr. Hill intimated that, owing to the success of this concert, it would be held annually, and the proceeds devoted to one of the trade charities. The toast was received with prolonged applause and musical honours. Mr. Garrard, in replying, thanked those present for the very kind manner in which his health had been proposed. It was indeed, he said, a pleasure to meet so many of his fellow-craftsmen in that way, especially when he remembered that this institution would not only increase friendly feeling, but was likely to be of permanent benefit to one or more of our worthy trade charities. Mr. Garrard then gave some interesting personal reminiscences, and concluded by referring in the most eulogistic terms to the hon. secretary, through whose energy and enthusiasm the concert had been a great success. (Cheers.)

Mr. S. Drayson next proposed the health of the hon. secretary. This toast was likewise received with musical honours and long-continued applause.

Mr. Hill briefly but gracefully replied. He said that if all present had spent an enjoyable evening, he was amply repaid for all trouble that he had taken. He felt it his duty to say that a very large amount of the success of the concert was due to Mr. Kift, who, without question, had provided them with a first-class programme. (Cheers.)

Mr. Kift returned thanks, and the gathering closed with "God Save the Queen."

News in a Nutshell.

A nickel mine, reported to be of great value, has been discovered in Queen's County, Nova Scotia. Mining experts and capitalists have gone to investigate.

Two jewellers' shops in Briggate, Leeds, occupied respectively by Messrs. Stuart and Co. and Mr. J. H. Barker, were broken into the other night, and property stolen of the value of £600. The thieves obtained access by boring holes through the floors of the rooms above the respective shops.

Messrs. Mappin and Webb are prosecuting William Andrew, a clerk, for the theft of a quantity of silver and plated goods, obtained, as alleged, by a forged order. The goods were forwarded to Ramsgate in response to a telegram purporting to come from Colonel Stanley Arnold.

Two little schoolboys at Ramsbottom walked into the shop of Mr. Abraham Wood and stole four watches, of which, not knowing what to do with them, they sold one for a shilling and gave the rest away.

Among the applicants at the Lambeth Police Court the other day was a jeweller, who complained that an assistant had left his employ without giving a week's notice. The magistrate said that, unless there was an agreement between the parties, the man could leave when he liked, the applicant's remedy being in the County Court.

Burglars broke into the shop of Mr. Kraetzer, watchmaker, of Dunedin, and were commencing an attack on the safe containing £3,500 worth of jewellery, when they were surprised and captured.

Bernard Rosenbloom, a Russian Jew, employed by Mr. Benjamin, jeweller, of Newcastle, has been sentenced, at the Cumberland Assizes, to one month's hard labour, for fraud. He entered a clogger's shop at Carlisle, and sold a brass ring to the proprietor for 10s. 6d., on the pretence that it was gold.

By representing that he had a purchaser for them, John Robert Williams, 22, describing himself as a jeweller, obtained from Frederick Steitz, diamond merchant, of Clerkenwell, various articles of jewellery worth £301, which he subsequently pawned. He was arrested, and is under remand, without bail.

Mr. Robert Galloway, jeweller, 9, Duncan-street, Leeds, has been the victim of a couple of rogues. One induced him to go outside to identify a special article wanted in the window, and the second thereupon attempted to bolt with a trayful of rings. Mr. Galloway seized him, a struggle ensued, and the rings, worth nearly £200, were scattered about the pavement. The rogue got away, and the jeweller lost three of his rings. A man, who was seen to pick one of them up, and who pawned it on the following day, is awaiting trial.

A Birmingham jeweller named Alfred Smith, residing at Norton-street, has been fined half-a-sovereign for threatening people with a revolver while drunk.

The three Americans, Wright, Irving, and Condy, who recently robbed several London jewellers, have pleaded guilty, sentence being postponed.

Mrs. Bradey, an elderly lady, was in charge of the shop of Mr. George Bradey, watchmaker and jeweller, of 137, Norfolk-street, Sheffield, the other evening, when three flashily-dressed men entered and asked to see a case of pins, and selected one. They, however, changed their mind about buying it, and one of them went outside to indicate another pin which they preferred. The old lady, putting the first case on a shelf opposite the counter, turned to the window whilst the man outside nodded his head to indicate the choice, and one of those inside assisted by standing beside her and pointing out the pins. Finally, after spending a considerable time looking over the pins, the men left, one of them saying, "Oh, never mind, don't bother," and the other thanking Mrs. Bradey for her trouble. When they were gone she found the case of pins had also gone from the shelf. Their value was £20, and the thieves have not since been heard of.

Mr. Arthur E. Bateman has been robbed of £4,000 of diamonds at his hotel in New York. His French nurse is under arrest.

James Stanley, jobbing clock and watch maker, of Barnard Castle, is awaiting trial on the charge of being fraudulent bailee of several watches entrusted to him for repair, which he pawned.

Laura James, 26, whilst in the shop of Mr. W. Gabriel, of 25, Bishopsgate-street, appropriated a ring, but was observed, and is now in prison.

Inexhaustible mines of onyx, claimed to be superior to that of Mexico, have been discovered in caves in the Ozark Mountains, within 70 miles of St. Louis, and a syndicate has been formed to market the product. The onyx is found in stalagmites and solid ledges many feet thick.

Among the presents given to the Princess Victoria on the occasion of her marriage was a curiously beautiful necklet, consisting of five rows of Indian pearls, from the Duke and Duchess of Connaught. Each row has a pendant, the top one being composed of diamonds, the second of sapphires, the third of moonstones, the fourth of emeralds, and the fifth of rubies. Such an ornament as this would obliterate many women. The bride's cousin, the Grand Duchess

Serge, and the Grand Duke, gave a Russian tea-service of pure gold. The teapot, sugar-basin, cups, and spoons are all exquisitely enamelled.

Provost Brown, of Galashiels, having had born unto him a son during his tenure of office, the members of the corporation have given him a very handsome solid silver cradle, in crescent form, richly chased, and ornamented with the arms of the town.

The robberies of jewels on the Belgian railways continue. About £2,600 worth of booty was secured at the expense of the Baroness Rothschild, and now another lady travelling is said to have lost a casket full of gems.

Lawrence Plunkett, hairdresser, has been summoned at Liverpool, under the Merchandise Marks Act, for applying false trade marks descriptions to clocks, over one row of which he hung a card with the inscription: "Genuine American timekeepers, perfect timekeepers, only 3s. 11d."; and over another row, "Genuine American alarum clocks, perfect timekeepers, only 5s. 11d." One of each of these being purchased, turned out to be of German make, and a fine of 20s. and costs in the one case, and 1s. costs in the other, was imposed. The prosecution was at the instance of the American Watch Company.

We have inspected at the show-rooms of the London Stereoscopic Company, in Cheapside, a series of admirable process prints from photographs of presentation plate and jewellery. These prints are specially effective for use in catalogues and price lists.

Gazette.

Bankruptcy Proceedings.

Barwick, Samuel, 26, High-street, and 42, Wide Bargate, Boston, watchmaker and jeweller. First meeting and examination.

Hayes, James, 41, Upper-street, Islington, jeweller. First meeting and examination.

Joseph, Isaac, trading as Joseph Davis and Co., and late as Joseph Davis, 6, Kennington-park-road, Kennington, late International Exhibition, Leeds, general manager of the International Exhibition, now optician. Receiving Order and adjudication. First meeting and examination.

Rankin, James, Bridge-street, Glasgow, watchmaker and jeweller. Petition for discharge.

Medlen, Montague, 144, Herbert-road, Plumstead, late 246, Kentish-town-road, jeweller. First meeting.

Shaw, William James, 364, Euston-road, watchmaker and jeweller. Receiving Order. First meeting, examination and adjudication.

Gardner, William Henry Buckby, 5, Russell-terrace, Old Allesley-road, Coventry, watch manufacturer. Receiving Order.

Gardner, William Henry Buckby, 5, Russell-terrace, Old Allesley road, Coventry, watch manufacturer. First meeting and adjudication; Examination December 22nd.

Braun, Isidor, 44, Hatton-garden, dealer in pearls and diamonds. Receiving Order: First meeting and examination; Adjudication.

Dividends Declared.

Arkinstall, Joseph, 2, Blackburn-road, Bolton, and Rushy Fold-lane, Halliwell, watchmaker and jeweller. First and final dividend of 6s. 2d.

Dowler, Thomas William, Trafalgar-road, Moseley, near Birmingham, and 94, Great Charles-street, Birmingham, jeweller and metal ornament worker. First and final dividend of 1s. 2d.

Hook, John James, Midsomer Norton, watchmaker and jeweller. First and final dividend of 2s. 10d.

Ellison, Richard, trading as James Blakey, 212 and 214, Kirkstall-road, and 1 and 3, Thornton-street, Kirkstall-road, Leeds, pawnbroker and clothier. Second and final dividend of 4s. 6d.

Whalley, Robert, 43, Church-street, Colne, and 1, Church-street, Barnoldswick, watchmaker and jeweller. First and final dividend of 8d.

Long, Joseph Edward, Bishop's Stortford, pawnbroker and clothier. First and final dividend of 4s. 6d.

Druiff, Lionel (trading as Henry Laurance, and as the Society of London Opticians), 44, Hatton-garden, Holborn, 26, Doughty-street, and Colonial-buildings, Hatton-garden, London, manufacturing optician. First and final dividend of 10d.

Marsh, Walter Thomas, 148, High-street, Watford, watchmaker, jeweller, and machinist. First and final dividend of 3s. 8d.

Fileman, Henry, 49 and 51, Hornsey-road, 9, Priory-terrace, Acton, 51, High-street, Kingsland, 33, Church-street, Camberwell, 157, Queen's-road, Peckham, and 45, High-street, Northfleet, pawnbroker, jeweller, and general salesman. First and final dividend of 3s. 6½d.

Langstaffe, William, trading as William Langstaffe and Co., Ebor-house, Nun Monckton, wholesale gold and silver English watch factor. First and final dividend of 2s. 3d.

Davis, Richard Perkin, 20, Church-street, Lozells, and 169½, Hockley-hill, Birmingham, jeweller and silversmith. First and final dividend of 2s. 3½d.

Bills of Sale.

Chapman, Frank, 8, Austin-terrace, Cheverton-road, Hornsey, jeweller's manager and traveller. Drawn in favour of Alexander Andrade; filed October 31; £90.

Polak, Joseph Maurice, 35, Compton-road, Highbury, diamond splitter. Drawn in favour of H. M. Harris; filed November 1; £150. Satisfied October 30, £90.

Marshman, Robert, Hampshire-house, Orford-road, Walthamstow, jeweller and watch and clock maker. Drawn in favour of Consolidated Company, Limited; filed November 4; £36.

Keith, William, Mussenden, Horton Kirby, and 39, Leather-lane, Holborn, ivory cutter and merchant. Drawn in favour of Charing Cross Bank; filed November 8; £150 of property at Mussenden aforesaid.

Toole, Edwin John, 154, Commercial-road, Peckham, optician. Drawn in favour of Thomas Fairhead; filed November 5; £40.

Jones, Thomas Edmund, 5, Crosspark-terrace, Heavitree, and 1, St. Martin's-lane, Exeter, watchmaker, jeweller, and optician. Drawn in favour of Ethel G. Jones (his wife); filed November 12; £114 of household furniture.

Gillett, William Joseph, 8, Holywell-street, Strand, and Gillett, Arthur, same address, opticians. Drawn in favour of Sarah Gillett; filed November 11; £138.

Norman, George Swainston, 104, Denbigh-street, Pimlico, watchmaker and jeweller. Drawn in favour of Edwin Bromwich; filed November 13; settlement in trust for wife.

County Court Judgments.

Keyzor, George B., 39, Hatton-garden, E.C., optician; £12 1s. 6d. October 14th.

Collyer, Thomas R., Highbridge, jeweller; £14 13s. 8d. October 7th.

Winter, Thomas, 6, Arthur-street, Coventry, watchmaker; £20 9s. 4d.

Simpson, Joseph, Holly-lane, Sheffield, pearl cutter; £11 13s. 1d. October 9th.

Garritt, I. I., 18, Clerkenwell-road, electro-plater; £17 2s. 6d. October 16th.

Ridley, Henry, 15, Meredith street, Clerkenwell, dial painter; £13 7s. 6d. October 16th.

Adams, Edward J., jun., Great Hampton-street, Birmingham, optician; £10 3s. October 14th.

Manton, James, 14, Vyse-street, Birmingham, jeweller; £18 9s. October 15th.

Newton, H. T., Stonegate, York, watchmaker; £13 6s. October 14th.

Brearley, John, Eagle brow, Lymm, jeweller; £10 8s. 6d. October 23rd.

English, S. R., 22, Thomas-street, Stokes-croft, Bristol, jeweller; £10 19s. October 22nd.

MUDON, John, Kirkdale, Sydenham, jeweller; £16 8s. 2d. October 15th.

KENT, BYRNE, and Co., 64 and 65, Bread-street (Cheapside end), London, jewellers; £10 6s 5d. October 22nd.

THORPE, Arthur Charles, 7, Cambridge-road, Teddington, dealer in precious stones; £16 6s. 4d. October 17th.

WALKER, Henry, 22, Milton-street, Nottingham, jeweller, and J. E. Riley, solicitor; £10 7s. October 20th.

WALL, J., Rotherham, jeweller; £18 19s. 9d. October 22nd.

ROBERTS, Walter James. Boar's Head Hotel, Chester-street, Mold, watchmaker; £41 0s. 4d. October 22nd.

KEMP, E., 61, High-street, Battle, jeweller; £11 14s. 1d. October 23rd.

WYATT, William Thomas, Blandford, jeweller; £21 10s. 1d. October 21st.

GOLLANCZ, Maurice, 154, Houndsditch, London, jeweller; £18 4s. and £16 17s. 6d. October 29th.

LANGHELT, G., 3, Cambridge Villas, Granger-road, Ramsgate, watchmaker; £17 0s. 3d. October 23rd.

Dissolutions of Partnerships.

CARRINGTON AND GORDIN, 111, Vyse-street, Birmingham, jewellers. Oct. 24. Debts by William John Carrington, who continues.

GRAHAM AND PARKES, 43, Canning-street, Liverpool, chronometer makers and opticians. Oct. 24. Debts by John Parkes.

WALKER, FREDERICK, AND WILLIAM PAGE, 35, Great Portland-street, W., dealers in plate and antiquities. Nov. 5. Pursuant to Decretal Order of the C.C, Bloomsbury.

DIXON, B. R. (John Pickman and Benjamin Robert Dixon), 40, Oxford-street, Salford, pawnbrokers. Nov. 4.

WATSON, J. W., AND Co., 12, Hatton-yard, Hatton-garden, art metal workers. Aug. 30, as regards Dalton Dannatt.

CAIRNS AND MABON, 10, West Campbell-street, Glasgow, manufacturing opticians, electricians, and mathematical instrument makers. Nov. 8. Debts by William Cairns, who continues in his own name.

FISH, George L., AND SON, 379, Kentish-town-road, pawnbrokers, jewellers, silversmiths, and salesmen. Debts by Arthur Sams Fish.

DARLING AND BENNETT, 16, Brewer-street, Regent street, manufacturing jewellers. Debts by Alfred John Bennett, who continues.

Lists of Creditors.

BRAUN, ISIDOR, dealer in pearls and diamonds, 44, Hatton-garden, London. Liabilities, £11,262 6s. 8d. Assets, £7,266 17s. 4d. Deficiency, £3,995 9s. 4d.

Creditors.		£	s.	d.
Brukowsky, J.	London	245	15	0
Evans, Thomas	,,	207	0	0
Goldschmidt, L. A.	,,	621	10	0
Hulme and Woltimar	,,	36	0	0
Hahn and Co.	,,	20	0	0
Liverson, Forster and Co.	,,	347	12	6
Lindow, J.	,,	58	0	0
Pittar, Leverson and Co.	,,	2,241	4	0
Robinson, P., and Co.	,,	1,173	13	9
Smith, G.	,,	92	15	0
Schmidt, W.	,,	72	10	0
Susson, D., and Co.	,,	600	6	6
Tripp, W. J.	,,	110	2	6
Whitehorn, Ernest	,,	128	15	0
Powell, F., and Co.	Egham	24	0	0
Brunner, A.	Paris	186	6	0
Cæsar, Christian	,,	1,391	0	0
Cæsar, Augustus	,,	1,041	0	0
Clement, Clement	,,	195	0	0
Ettinghausen, H. L.	,,	120	0	0
Guillaume, N.	,,	257	7	5
Peczenik, L., and Co.	,,	179	16	0
Sachs, L., and Co.	,,	258	13	0
Weinmann and Co.	,,	263	16	0
Fully Secured Creditors.				
Attenborough, Richard	London	4,397	16	2
Attenborough, E. S.	,,	4,043	11	11
Attenborough, P. P.		120	0	0
Vaughan, C. B.		1,034	1	5
Sanderson, E.		1,425	12	10
Partly Secured Creditors.		£.	s.	d.
Benesh, H.	London	300	0	0
Mann and Taylor	,,	400	0	0
Liabilities Expected to Rank.				
Sassoon and Co.	London	420	0	0
Spink and Sons	,,	340	0	0
Cæsar, C.	Paris	140	0	0
Liabilities Not Expected to Rank		1,511	9	11

ISAAC, JOSEPH (trading as Joseph Davis and Co., and lately as Joseph Davis), optician, late general manager of the International Exhibition, Leeds; 6, Kennington-park-road, London; late the International Exhibition, Leeds.

Creditors.		£	s.	d.
Abrahams, Hyman, and Sons	London	52	14	6
Brock and Co.	,,	30	0	0
Beyfus, Julius, and Co.	,,	38	2	10
Howlett and Son	,,	21	7	6
Pain, J., and Son	,,	21	2	6
Piggott Bros.	,,	394	5	0
Russell, John, and Co., Limited	,,	80	18	1
Wilkes and Co.	,,	30	0	0
Smart, Jackson W.	,,	42	1	2
Schmidt, G.	Germany	21	6	7
Beevers, Charles (Trustee Estate W. J. Dixon)	Leeds	50	14	6
Bakewell, W.	,,	278	0	0
Cooke, Alfred	,,	77	17	6
Dickenson, F. W.	,,	73	0	0
Goring, Dan	,,	25	0	0
"Leeds Mercury"	,,	23	12	0
Oldroyd, E.	,,	30	14	7
Owen, Captain	,,	24	0	0
Police (W. Derry, Esq.)	,,	39	8	3
Petty and Son	,,	111	0	0
Sheldon and Sons	,,	70	18	0
Spark and Sons	,,	66	4	0
Walker, W.	,,	61	14	4
Wood and Holdsworth	,,	373	0	0
Wood, Hoffman	,,	151	3	0
Wooler, Edwin	,,	60	7	11
"Yorkshire Post"	,,	48	10	6
Taylor, Garnett, and Co.	Manchester	21	14	11
Gray and Co.	Newcastle-upon-Tyne	111	8	0
Ryder, Captain	South Shields	55	0	0

(And several amounts under £20)

Total Estimated Amount—£2,733 11s. 9d

Partly Secured Creditors.		£	s.	d.
Turner, Sharon	London	80	0	0
Ives and Co.	Shipley	1,417	3	9
Preferential Creditors.				
Johnson and Matthey	London	16	7	5
Corporation of Leeds	Leeds	177	4	10
Wilson, Edmund	,,	100	0	0

Total Estimated Amount—£303 0s. 10d.

Deeds of Arrangement.

HANDS, HENRY, AND SON, 38, London-street, Norwich, jewellers (Partners, Henry Hands and Henry Randolph Hands). Trustee, John Wm. Barratt, 22, Waterloo-street, Birmingham, C.A. Unsecured Liabilities, £4,794 17s. 3d.; Estimated Net Assets, £2,000. Filed November 4, 1890.

Creditors.		£	s.	d.
Bendon, George, and Co.	London	15	0	0
Holland, Aldwinckle, and Slater	,,	12	0	0
Carley, George, and Co.	,,	15	0	0
Weill and Co.	,,	10	0	0
Lane, Mary	,,	215	0	0
Wilmot, E. D., and Son	Birmingham	556	0	0
Wilmot, Edward Derwood (Exors. of)	,,	3,571	0	0
Wilkinson, T., and Sons	,,	23	0	0
Bourne, Henry	,,	18	0	0
Hands, Rosetta	Norwich	150	0	0
Gurneys and Co.	,,	30	0	0
Corporation of Norwich	,,	16	0	0
Platt, John	,,	75	0	0
Martin, Hall and Co.	Sheffield	14	0	0
Gallimore, John	,,	10	0	0

Shaw, William James watchmaker and jeweller, 364, Euston-road.

Creditors.		£	s.	d.
Barnett George	London	25	9	0
Bowman, R. T.	,,	410	0	5
Levenberg, Moses	,,	392	0	0
Lewis, William	,,	274	6	6
Schwersu, S. H.	,,	403	7	0
Total Estimated Amount—£1,596 7s. 11d.				
Fully and partly secured Creditors		127	0	0

McClellan, Samuel Barton, 10, Norfolk-terrace, Sidcup, watchmaker, photographer, and electrical engineer. Trustee, Frank Fletcher, of Chiswell House, Finsbury-pavement, E.C. Unsecured Liabilities, £349 13s. 11d.; Estimated Net Assets, £150. Filed November 20.

Creditors.		£	s.	d.
Baldwin, G.	London	66	0	0
Davenport, A. J., and Co.	,,	18	2	8
Harris, C.	,,	20	0	0
Mitchell, A. J.	,,	42	10	0
Martin's Bank	Sidcup	63	11	4
Shapley, D.	,,	30	0	0

An Irish Tradesman's Protest.

Thomas Frederick Williams, trading as Williams and Co., watch-material manufacturers at Prescot, has appeared on adjournment on his public examination in the Liverpool Bankruptcy Court. The Registrar said he had received a letter from a gentleman in Tipperary, complaining about some statement made by the bankrupt at the last examination. It was written by W. Hilliard, watchmaker and jeweller, Tipperary, and complained of the following statement made by Mr. Williams:—"Since then, however, he had several heavy losses, including one of over £100 through the evictions in Tipperary. Nearly all the men in the trade in Main-street, there and their business, and in some cases their stocks also, had been destroyed."—The Bankrupt said that he intended to imply that he had lost the money in Tipperary and neighbourhood. He was sorry he had made such a blunder.—The Official Receiver added that Mr. Hilliard stated that he was the only person since 1883 who had been engaged in Main-street, Tipperary, and who in that trade had been evicted. He had only three small transactions, amounting to £2 10s. 6d., with the Messrs. Williams, and the money had never been demanded from him. Although he had been evicted six months, Mr. Williams willingly gave him credit. His trade had not been destroyed by the evictions, and his business was carried on in his new home in the same way as it was in Main-street.—Questioned by Mr. Gittens, the bankrupt said he had lost £12 to £15 in Tipperary town.—The Official Receiver: Then what was the use of talking about having lost £100 in Tipperary? The Registrar said it appeared from the letter that there was danger of an injury being done to a tradesman in Tipperary, and that was why he thought the matter should be mentioned.—The examination was further adjourned.

Great Failure in the Diamond Trade.

The diamond merchants of New York are in a flutter of excitement over the failure of Messrs. D. H. Wickham and Co., one of the largest diamond-importing houses. It is reported that a good many of their liabilities are among London houses. Mason, Munroe, and Co., bankers, of New York and Paris, are on the list of preferred creditors to the amount of about one-third of Messrs. Wickham and Co.'s assets.

Pawning in the Trade.

Robert M'Innes, watchmaker and jeweller, 8, Buchanan-street, Glasgow, trading under the firm of M'Innes Brothers, of which he is sole partner, has been examined in the Glasgow Bankruptcy Court. Bankrupt stated that he was formerly in business with his brother, but that they dissolved partnership about three years ago. Some of the creditors at that time claimed under the present sequestration. He looked after the mechanical instrument department, and his manager conducted the jewellery business and kept the books, as he knew nothing about bookkeeping. Since his brother's retiral there had only been one balance made. His wife made a claim upon the estate for £3,000, and in addition he was behind some £9,000. He was aware there had been considerable pledging of goods. The system had been involving the payment of large sums of interest. They pledged to take the goods out of people's hands who were calling for interest. They pledged goods to relieve goods, not to raise money. He was, however, absolutely ignorant of the tremendous extent to which pawning was going on, and of the advances made thereon, and the large sums that had been paid for interest. Asked if for the last three years there has been a thousand a year paid for interest on pledges, bankrupt said he was not aware of that. At a later hearing the deposition of his manager—who averred that all that was done Mr. M'Innes had been cognisant of—having been read over, the bankrupt observed that in almost every particular it was in direct contradistinction to his own. He had nothing to add to his former deposition, which he adhered to. He never gave the manager any goods to pawn, nor to redeem or repledge, except what he had referred to in his last examination. Altogether his personal pledgings did not exceed £200, and he was sure the goods he pledged were paid for. He did not try to sell pawn-tickets in London, and he never granted I O U's to pawnbrokers. The examination was closed.

On Borrowed Capital.

Samuel Berwick, watchmaker and jeweller, High-street and Bargate, Boston, whose unsecured liabilities amount to £549 6s. 3d., and assets amount to £296 6s. 8d., leaving a deficiency of £252 19s. 7d., has stated in the local Bankruptcy Court that he commenced business in 1875, with £200 borrowed capital and an overdraft at the bank of £140. He first became aware of his insolvency about three years ago, since which date the greater part of his liabilities had been incurred. He said he hoped for better trade as times became better, and expected to be able to meet these liabilities as he had done previous ones. He attributed his failure to trading on borrowed capital and bad trade. The public examination was closed.

A Hatton Garden Smash.

Under the recent failure of Isidor Braun, of 44, Hatton-garden, dealer in pearls and diamonds, a summary of the debtor's affairs has been issued, together with the Official Receiver's observations. The gross liabilities are £23,024, of which £11,262 are expected to rank, and the assets are estimated at £7,266. The debtor states that he commenced business about 13 years ago without capital, and that he had to rely upon advances from pawnbrokers, to whom he now owes about £10,000. The Official Receiver observes that the deficiency has not been properly accounted for, and the debtor has been required to prepare an amended account.

ANSWERS TO CORRESPONDENTS.

F. M. M., Bournemouth.—Your description is hardly clear enough to follow. If you will send a more explicit account we shall be pleased to tell you all about it.

W. L., Chelmsford.—This is entirely a legal matter, but we think you need not fear the case being taken into court. The point is one of great interest to the trade, and you will find extended reference to it in the present number.

R. S., Bury.—A directory of the kind you require is published at Coventry.

The Watchmaker, Jeweller and Silversmith.

Entered at Stationers' Hall.] [*Registered for Transmission Abroad.*

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SPECIAL NOTICES.

☞ A useful and handsome DIARY for 1891, in connection with this Journal, is now ready.

☞ All SUBSCRIPTIONS will, in future, be *Payable in Advance.* Subscriptions for 1891 are now due; and the Publishers will feel indebted if these are remitted, and the necessity for application avoided.

All communications to be addressed to the Publishers—

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WE think it desirable to state that this Journal is under entirely new proprietorship, new management, and new editorship. In regard to the literary department, it may be mentioned that the services of leading authorities in the several sections have been secured; each writer assumes the responsibility for his own words, and although a general editor has been appointed in the person of a gentleman of high literary attainments and long experience in trade matters, who will take charge after the present issue, it may be taken as a matter of fact that the journal is under the joint-editorship of three or four thoroughly practical writers, each of established reputation in his own department. We feel assured that the adoption of this system, eminently successful in similar cases, will at once justify itself; and the improvement already effected in the literary contents will be an earnest of what is intended and what is to come.

One forthcoming feature, which should prove both interesting and valuable, may be at once announced. For ten years the City and Guilds of London Institute has held examinations in watch and clock making, and the questions set are framed on the basis of the syllabus, which again is compiled with a view of conveying by the Institute's teachers the best possible instruction. It follows, as a reasonable inference, that answers to these questions will supply much valuable practical information to all sections of the trade, and, therefore, will be of interest to workmen and students. Accordingly, we have made arrangements for this object with Mr. Hermann, Director of the Polytechnic School of Watch and Clockmaking, who, besides being an old practical contributor of this journal, is well known as a teacher and honours-man of the City and Guilds Institute from the very first, as well as of the Science and Art Department. The questions will be reproduced, and the answers arranged, so as to be intelligible to the most elementary operative, and at the same time provision will be made for the student and candidate of the City and Guilds of London Institute certificate, so that on the whole the papers will cover as much ground as possible, and be of general and varied interest.

We have also arranged for a periodical letter from the South African fields; and a further new feature in the present number is an "Answers to Correspondents" column. In this section, all questions of general interest put by our readers will be replied to.

THE YEAR PAST.

FOR the trades of which this journal is the representative organ, the year 1890 was characterised by numerous events, the importance of which lay buried in the unknown future. Perhaps the most important one was the realization of the results of the amalgamation scheme of the diamond mines, under the astute direction of the Cape Premier, Mr. Cecil Rhodes. The effect upon trade of this action has proved to be far greater than might have been imagined. All the early part of the year large manufacturers abstained from buying for making up stock, under the belief in what was predicted by some, that "the diamond corner must smash." But the combination was under too good management, and had too large a reserve behind it for anything like this to happen. The unparalleled fact was not realized that this union had the monopoly of nine out of every ten carats of rough put into the market, and were thus quite empowered to limit the output, and as price is always a question of supply and demand they would be able to run value up as they limited the output. This is just what they did ; they ran the price up from 17s. to 40s., a difference of over one hundred per cent. Naturally against these new prices large buyers protested strongly, and month after month foreign buyers returned as they came, without doing business. Meantime the unsold stock of rough was weekly increasing, while much less finished goods were being brought into the market ; and with decreased activity the number of unemployed diamond cutters began to increase. At first this was attributed to the buyers leaving their stuff in London to be cut ; and serious projects were conceived in Amsterdam to found a Company for diamond cutting and buying, or, failing this, for removing the industry to London. It is certain that the diamond cutters in London have not been at a standstill for work, whilst there are thousands out of employment in Amsterdam. We are looking forward to the time when less and less will be sent abroad to be cut, and each time an English cutter secures the patronage of a broker, one more nail is driven into the coffin of foreign cutting. By the middle of the year both manufacturers and brokers had learned to treat the dominant prices as at least unavoidable, and bought a little more freely ; and by the autumn, when it was necessary to buy for Christmas stock, the altered position was fully realized, and up to the end of the year prices showed no abatement. At the same time, there is a hitch somewhere, as the advance on finished goods is certainly not so high as that on the rough. Mellée, which formerly brought, say £4 or £4 5s., will not now bring over £8, the prices for good clean well-cut now being £7 to £8.

Turning to Watchmaking, we are disposed to think that 1890 has been a year of remarkable seed sowing, or rather the springing up of good grain introduced earlier, as is testified by the developments of the factories of Coventry, Prescot, and elsewhere ; there always has to be a beginning even of the largest things, and how great is the future that lies before our English factories, lies entirely with the mode of procedure they adopt. Let us earnestly hope, however, home manufacturers will profit by the experience of other companies, whether Swiss or American. Probably one of the most soul-stirring incidents in this trade, and the one calculated to do the most good, was the paper read by Mr. Tripplin before the Society of Arts, and the discussion which followed probably brought more of the facts of what we are doing in our English factories to the front, than all other circumstances put together. We are aware that some manufacturers objected to the general tenor of the paper and the speeches, saying they were too much in one key, but we cannot help thinking that it was their duty to come forward and take advantage of the occasion, for to let such occasions pass is to let judgment go by defaulter. On the whole, we are certain that a year fraught with better results or better promise for the English watchmaking trade, we have never had the pleasure of contemplating.

For the Silver Trade 1890 has been of special interest, and the year has witnessed the victorious realization of a battle fought by some of the members of the trade for nearly a quarter of a century. It is undeniable that during the last half of the year, or from the removal of the duty from plate, the silver trade has been exceptionally busy ; whether this is to be attributed to the removal of the duty, or to the insetting of fashion in silver articles, is a question upon which there may be a diversion of opinion. It has frequently been remarked by the enthusiastic abolitionists that the high price of silver is to be attributed to the impetus given by the removal of the duty ; a little reflection upon the up-and-down motion that silver has suffered, and is suffering, from day by day, would show the cause or causes to be still in operation, be they what they may. The whole of the advance is to be attributed to the American Silver Currency Bill, which authorises the Government to buy silver up to 4,500,000 ozs. a month until it reaches parity, that is up to $1 for every 371¼ grains, which is the weight of silver in the dollar, or $1·2929 per oz. fine. Obviously they could not exceed this, or coining would be a losing game. Now the maintenance of the price of silver must depend upon the world's supply as well as to the demands ; whether the great mines which have for years been working under pressure in order to pay a certain dividend will now be satisfied with the same dividend, obtained by a limited output, or whether the high price will stimulate the silver mining industry to open up fresh mines and so saturate the market and keep down its price, we cannot say. In the meantime, the manufacturer does not feel oversured, in a market varying over 30 per cent. in a twelvemonth, a rate by no means borne by the American requirements to the world's output : and one which raises suspicions of "jobbery" in the background. There is one feature that the retailer has to fight against, and that is, that in consequence of the removal of the duty, everyone's mouth is full of "eighteenpence an oz. off," on original cost, and therefore everything is expected to be so much cheaper, "certainly not much more than two-thirds of the old price ;" as a matter of fact the amount returned was only fifteenpence, and with the rise of a shilling in silver, the original cost of the article is not much less than heretofore. But, despite all this, and not considering the natural lull that preceded the abolition of duty, the silver trade has been all through the year quite up to the average, and, in fact, in many instances of which we are aware, business has been greatly in excess of former years.

For Electroplaters 1890, too, has been of exceptional business on all sides. The large firms have been adding new premises, or enlarging old ones, laying down new machinery, and taking on extra hands. The whole of our monthly reports from Sheffield and elsewhere have teemed with this sort of thing. In the early part of the year there was one of the largest orders to be executed that was probably ever given, the order numbering tens of thousands of dozens of spoons and forks, and although this was of continental origin, one feels proud that Sheffield got the commission. The name of Sheffield plate still carries its good name with it ; may it ever continue to do so.

The Jewellery trade for the year has been certainly up to the average, and considering how materially it was affected in its upper branches by the increased price of diamonds, we may be fairly satisfied with the year's doings. At some parts of the year, notably the early autumn, business was wonderfully brisk, many of the large firms scoring by far the best months they had ever had. The disastrous financial crisis, however, played sad havoc with the December and Christmas trade, which was most felt by those houses doing largely with stock-brokers and the like. The smaller shops did not feel the crisis so badly, nor did those who go in more for the necessary articles of life. The bad weather just before Christmas was enough to cripple any season trade.

After all, perhaps, one of the best gauge of a year's business is the Bankruptcy Court; and, if we add all the deficiencies recorded together, leaving out, say, the one in Hatton-garden, the total does not amount to as much as a single failure in some other years has done. We may, then, fairly congratulate ourselves on having had a prosperous year; and that it may be followed by an even more prosperous twelvemonth, in the good things of which every one of our readers may participate, is our most sincere wish.

THE MONTH PAST.

Twice-Lucky Turquoise.

THERE are several things to help to account for the rapid strides in public favour which the turquoise has made of late. Firstly, as Sir George Birdwood once observed, jewellery must be symbolic or nothing. If the moonstone's run is to be attributed to its being regarded as the emblem of good luck, how great a future may we not predict for the twice-lucky turquoise, which even the money-loving Shylock said was worth a "wilderness of monkeys," although Shylock's love was mild compared with that existing in the Middle Ages, in which time it was supposed to take upon itself any harm which might otherwise happen to the owners. If the owner was thrown from his horse, the turquoise would be broken, and the limbs of the possessor spared. There are numerous "well-authenticated instances on record" of this happening. But unlike many superstitions, it did not die out in the Middle Ages; it has lasted down to the present day, especially in Germany. Many times have we known Germans in this country to be very particular in having a turquoise engagement ring; and by them it is believed to be a *gage d'amour*, its lustre keeping pace with the constancy of the lovers. There are a number of celebrated actresses, who have not only shown great attachment to it, but sometimes have gone so far as to never remove them from their arms day or night. Owing to the great and growing demand for these stones, manufacturers are very busy with them. It strikes one as very remarkable where on earth all these "turqs" have come from, as one daily looks through the various brokers' stocks; two years ago one could not have seen all through the trade as many as almost any broker to-day can show. We notice there is a great doubt in the minds of many manufacturers as to whether they are real or not. Perhaps Mr. Abbott will be good enough to point out the distinguishing characteristics at some length, when he can, as we believe there are three or four stones sold for turquoise, only one of which has a claim to the original name.

The Darwin Medal.

USUALLY when a presentation is to be made a committee is formed, who are in some way either connected with the recipients or the donors, and it is their judgment that decides whose designs shall be accepted. Often such an occasion is a red letter day in the sight-seeing lives of all concerned, an occasion on which they are brought face to face with things they have frequently never dreamed of. No wonder at the remarkable choice that is sometimes made. An old worn-out design, with neither beauty nor anything else to recommend it in the eyes of those who understand what things should be, is frequently chosen, while hundreds of much finer designs are passed by. This, however, was not the sort of tribunal by which the work of Mr. Allan Wyon, F.S.A., in the above medal was tried. As our readers are aware, the Royal Society have decided to have a medal struck in honour of the great naturalist, for presentation every two years to the one who has done the most in that special line of research in which the great master so unostentatiously worked. It is only natural that Mr. Alfred Russel Wallace should have been chosen as the first recipient, his life-work being so inseparable from that of Darwin, although as to subsequent recipients there may be some differences of opinion. There was one thing further upon which there was unanimity of opinion, viz., that the medal should be a good likeness of Charles Darwin, and that it should be emblematical of his life work. Nets were then cast round for the first authority into whose hands the creditable carrying out of the intention could be entrusted, and the lot fell upon Dr. John Evans, Treasurer of the Royal Society, and President of the Numismatic Society; and those who look upon the result will easily form an opinion as to how the Doctor fulfilled his trust. Then came a second choice, equally important, and to the Trade an even more interesting one, viz., to whom should the execution of the medal be confided? A higher compliment could not be paid a member of the Trade than having this medal entrusted to his skill. It is a silver medal, 2¼ inches in diameter, bearing upon the obverse an excellent portrait of Darwin, and upon the reverse wreaths of plants which have been the subject of his special study surrounding the name Carolus Darwin, with the dates of his birth and death. Those who know anything of the amount of exactness necessary to meet the demands of a knowledge so consummate as that of Dr. Evans, must not only congratulate Mr. Wyon upon his success, but feel proud of being engaged in a similar business. We remember being amongst a party invited to Dr. Evans's residence at Nash Mills, where we had the pleasure of examining a magnificent collection. Commencing with the library, we saw the unparalleled collection of Palæolithic implements from England, France, Spain, Africa, and India; Greek, Roman, Saxon, and Merovingian glass; and Damascene and Rhodian ware. In the inner library were Neolithic implements from all countries, together with those of modern savages; also relics of the Bronze age of every description and from every country, with a splendid display of pre-historic pottery, Venetian and other glasses, supplemented by arms and implements of modern savages. In the dining-room, there was a rich collection of early gold ornaments, Roman, Saxon, Merovingian and Mediæval jewellery, seals, etc., and Hispano-Moresco pottery. What would have most interested our readers, we think, were the poesy and other antique rings, of which there were about 500, the greater part of which bore inscriptions; whilst the numismatic collection in the drawing-room surpassed others already enumerated. Many of the medals were simply exquisite; and the early silver plate and ancient needle-work were enough to make any enthusiast break the tenth commandment. With experience drawn from such a rich mine as this, one may feel justly proud of the skill that can satisfy it.

Notes About Town.

(BY OUR LONDON CORRESPONDENT.)*

What is being Worn Fancy Gems. DESPITE the admiration of Mr. Tonks for all white gems, and his depreciation of coloured ones, it is a notable fact that since the Paris Exposition, and the magnificent displays it made of fancy stones, an impetus has been given to public taste towards them, and they are being extensively used in jewellery, perhaps rather more in Paris than in London; but Paris is usually the birthplace of novelties. They are, however, in far greater demand than I ever knew them before. In taking a walk through the West-end or City one can now see numerous fancy stones exposed in windows, to which in former times they were utter strangers.

* * *

Cameos once more. WITH the growing desire for coloured stones attention has been directed to those small knick-knacks that are usually preserved as articles of *vertu*, with the result of producing *bonbonnières* and such like things which bid fair to rival the elaborate snuff-boxes of the last century. In these, camei and intaglei are employed very freely, cut from such durable and valuable stones as topaz, beryls, and so on, ornamented with borders of diamonds, emeralds, and rubies. With the excellence being attained in the unencouraged glyptic art, camei and intaglei of rare merit are being produced, equalling many of the historic gems; and with the improved High Art productions, and their elevation to rank as gems, they are once more being extensively used in jewellery. Every day someone seems to be becoming more familiar with the individual peculiarities and beauties of the various stones, giving rise to happier combinations than we have perhaps ever seen displayed in jewellery.

* * *

Egyptian once more. IT is said that in Paris, since Sara Bernhardt's impersonation of Cleopatra, bracelets, collarettes, necklaces, hairpins, brooches and earrings are in demand in all kinds of Egyptian styles formed of such things as sphinxes, lotus leaves, asps, &c.; but as these are usually made in oxydized as well as gold, I fear they will not be taken up seriously by the more wealthy leaders of fashion, and that at least it can only be regarded as a passing craze which will probably die on the cessation of the piece. It is a little hurtful to our artistic taste to see these emblems, which in this country have been so faithfully preserved and so superbly worked up in platinum and gold by that well-known firm, not a hundred miles from Tottenham-court-road, now struck up from a bad die in oxydized cheap stuff.

* * *

Mrs. Langtry's Necklace. THE magnificent necklace worn by Mrs. Langtry in her impersonation of the same character is composed of ancient scarabæ, many of which are two or three thousand years old. I do not know if this will stimulate a craze for scarabæ; if it does, one is tempted to wonder what sort of price they will reach, as I once saw a collection that a gentleman had been out there ten years collecting, many of which cost him where they were found £50 each.

* * *

In the Upper Circles. THERE certainly seems a great many more pendant diamond necklaces convertible into tiaras now sold than was ever the case, and with that a deviation from the old patterns. A number of floral designs are now extensively employed, composed of *sixteenths* and *thirty-seconds* designed from such things as the conventionalised rose, separated by two or three leaves. Grain setting too is in great demand, as well as coloured stones. There are still roaming about the West-end, buyers prepared to go to four figures for a good ruby.

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Latest Engagement Rings. THE latest engagement ring is one the stone of which is symbolic of the month in which the engagement was actually made. Several subscribers having applied for a list of the stones symbolic of each month, such a list will be found in another part of this journal.

* * *

A look to-day brings a Customer to-morrow. WE perhaps hardly realise how much the displays we make are daily noted by the public, and the fruit they may bear to-morrow. I cut the following from the *Queen*, to show how much notice really is taken of what we show. A correspondent asks a question, which brings forth all this:

"Tempus Fugit" has hit upon a new and good idea. She might do well with some of the cheap American clocks which cost only a few shillings, and at the same time would find a sale for the more costly ones which would bring in more money. Vickery and Hobbs, 189, Regent-street, have some wonderful cheap and good-looking English eight-day clocks in all shades of morocco, moss-green, Gobelin blue, royal red, Sultan, and pale grey. These would show off well on the stalls. Dibden, at 189, Sloane-street, has some carriage clocks which are rather more expensive; and MacMichael, in South Audley-street, has a carriage basket combined with a clock, as well as a pretty heart-shaped silver clock on stand. Bayly, the Swiss Novelty Importer, at 85, High-street, Kingsland, has a cuckoo clock and weather-house combined, which would prove most attractive with its carved case and ivory hands. A cuckoo comes out when it strikes, and above is a weather-house with a male and female figure in peasant costume. He also sells a Capuchin monk clock. Here the monk comes out of his cell to pull a cord and ring a bell at the hours and half-hours; and the trumpeter clock to be had here also has a 4-inch high trumpeter playing a fanfare for every half-hour, and flourishes at the hours. Wales and McCulloch, of Ludgate-hill, sell the grandfather's chiming clock in old oak cases with a musical double chime, striking the hours on a rich cathedral gong; and, if "Tempus Fugit" can paint, I am sure she would do a good business with the pretty little cases of a grandfather shape, sold by Whiteley, which can also be had in poker work. They have an aperture for a watch, or small Waterbury clock. The tourist watch clock, sold for a few shillings, by Wainwright and Co., 4, Cambridge Buildings, John Bright-street, Birmingham, is worth a thought; and then there are the illuminated clocks, sold at 78, Vyse-street, Birmingham. One on a stand attached to a night-light, the other intended to be fastened on to the gas; and Soulter's patent illuminated clock, also hailing from Birmingham, can be fixed to any gas bracket. The Atmospheric Churn Company, New Bond-street, sell an illuminated dial clock and food warmer. She will be able to find many more for herself.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

The Silver Trade.

The Christmas Trade. THE first three weeks of December the whole of London houses were unable to keep pace with orders, and with some it has lasted all through the month. The disastrous fogs, which either shut up people prisoners in their own houses or drove them south, had a very bad effect upon the retail trade. But it cannot be denied that there is far more silver used than formerly. Every house one goes into, even the old conservative ones, which a few years ago would not have taken an order for anything out of their special line, are now to be seen busily engaged in making hair-brushes, toilet-boxes, and a host of little knick-knacks that would once have been far below their dignity.

* * *

Some Good Lines. THE Goldsmiths' and Silversmiths' Company have recently had several good lines, amongst which was a testimonial to Sir Robert Hart, G.C.M.G., Inspector-General of Chinese Imperial Maritime Customs. It consists of a centre-piece dessert stand and candelabra, the peculiar feature about it being the Chinese character of the design, or rather of the details, dragons, pagodas, palms and bamboos forming the elements of the design.

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ANOTHER line of importance which fell to the lot of the same firm was the magnificent presentation made to Mr. Thomas, the able manager of the *Graphic*, on the occasion of its "coming of age," which was celebrated by a dinner at the Hôtel Metropôle, participated in by over 300 guests, including Professor Hirkomer, R.A. (in the chair), Mr. Luke Fildes, R.A., Mr. Marcus Stone, R.A., Sir Jas. Linton, R.A., etc., representing the Fine Arts; while Mr. Walter Besant, Mr. William Black and others represented literature; while the noteworthy public were represented by the Postmaster-General, ex-Lord Mayor, Sir Spencer Wills, etc. Others might be mentioned, but sufficient have been, to show the kind of criticism that would be likely to be passed on the presentation, which consisted of two magnificent silver lamps upon Corinthian columns and bases, and a set of seven "Queen Anne" bowls.

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Messrs. Mappin Bros. THE newspapers have teemed lately with descriptions of the new premises recently opened, on what was originally the Anchor Restaraunt, Cheapside. The proprietors may certainly lay claim to having employed every modern improvement, both in the Cheapside house and also in the one in Regent-street; but we suppose it is no secret now who is effecting these changes. We noticed very large bills upon Messrs. Mappin and Webb's old establishment at the corner of Cheapside, announcing that *they* had not opened any new place. The opening of the new premises was celebrated by a spread, at which some 300 sat down.

* * *

Remonstrance for Athens. A VERY beautiful remonstrance for the service of a Greek church at Athens has been supplied to the order of Mr. A. J. Chadde, merchant, and Greek Consul for Birmingham. It is in silver, richly gilt in parts, being over two feet in height, and represents a Corinthian portico, having a dome surmounted by a Passion cross. There is a massive stand representing a series of steps, from which rise four Corinthian columns supporting a frieze. The frieze bears upon it the Greek characters Alpha and Omega, the figure of the Christos with the nimbus and hands raised in the act of blessing, according to the formula of the Greek Communion. Vine scrolls, with grapes, occupy the remaining centre of the frieze. In the pediment is the mystic triangle with rays issuant, and in the centre the eye of the Eternal. Above the mouldings of the pediment is the white dove descending, and thus the three emblems of the Trinity are given. The base of the dome is richly decorated with Greek bosses, and the dome itself adorned with golden stars, while gold rays issue from the mound at the summit upon which the cross is situated. Between the columns, in front, is an entrance door to the Temple, treated richly in gold and silver, and decorated strictly after the Corinthian style. This opens and discloses a silver box, which is to contain the bread used in the Holy Communion. An inscription in Greek, below the doors, indicates its purpose. The whole has been carried out in the best style by Messrs. T. and J. Bragg, of Birmingham, to designs approved.

Horological Notes.

ORIGINAL AND "CLIPPED."

A Natural History Clock.

WHEN we first saw the head of a tambourine improvised as an artist's canvas, we by no means admired it; and when we saw the complaint spreading, and tambourines being made expressly to paint upon, followed by fiddles in the white, banjos and guitars, we wondered when it would stop. The other day we saw the painted tambourines put to another use altogether. A clock movement has a pair of rather large hands, these are strongly magnitized both either N. or S. poles; and close to these hands is placed the tambourine as though it were the face of the clock. There are twelve flowers painted round the edge, each representing a month in the year; a butterfly is put over the minute hand, and a beetle, whose legs and up-turned toes are made of iron, over the hour hand. As the clock goes, the butterfly and beetle follow the hands with a most remarkable effect, being held in position by the magnetic action of the clock hands at the other side of the parchment.

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Watch Movements.

A CORRESPONDENT asks some one to give him a few hints how to judge the quality of watch movements when buying them, as he finds the majority of new cheap ladies' watches either continually stop or wont go at all. This is an interesting question, and as many of our readers may have the same experience, a few hints supplied to us by Mr. Ganney may be useful:—"Notwithstanding 40 years' experience at watch work, I find there is nothing so much like a good watch as a bad one to look at; and looking in shop windows, it always seems to me the thirty shilling wathces put the thirty guinea ones in the shade for attractiveness and popularity, and I have often seen the buyer choose the cheaper one as the best of two. A watch has two characters, one as an ornament and another as a machine, and with ladies the ornament has often the preference. Outside appearance of plates, bars, and wheels are generally unreliable, but I never knew taking off the dial fail to reveal the true character of the watch; this only takes a few minutes, and if the work there is as clean and good-looking as the outside, the intention was to make a reliable article. Much polish need not be looked for there, and the better the work the less polish will be found; but good shape and clean going work, and smooth action, if keyless, will indicate honest intention. It is noticeable that some of the cheaper machine-made movements give better results than the higher finished, hand-made cheap work, screws and bridges performing their functions without the constant failure observable in the others. Purchasing watches of reliable wholesale firms, such as are most advertisers in your pages, is probably the best method and only reliable way of keeping reliable stock; great bargains offered by unknown travellers and firms seldom prove profitable in the end, unless the buyer is really a horological expert. There are many points that may be noted, if a price is paid, and good work is really wanted. In Swiss watches, if good, the main spring is not very strong, and winds easily, the watch balance vibrating with good motion at the first turn of the mainspring, and the balance declining to set, or stop, if touched with a piece of stiff paper, or peg wood, lightly pointed. The tick of the watch is also a better guide than its outward appearance; as an untrue fourth or 'scape wheel will accelerate the beat and variations with the watch in different positions of its beat and vibration will indicate its being a bad one, even if highly finished. Turning the hands, and observing if they are the same distance from the dial and each other, at various points of the dial, will give a very good proof of the quality of the watch. The tightness of the joints of the case, and its shutting and opening without much force, will indicate the care and skill of the construction; in fact, the case may often serve as a guide to the character of the watch, apart from the quality of the gold or silver. Performance is not always a complete guide, as a common or rough-made watch may sometimes do well for a time, and stand bad usuage better than a fine watch, which, being worked with greater precision and delicacy, requires greater care; and its fine wheels and pinions and closely-worked parts will not allow the intrusion of dirt, as readily as the cheap one; and its mainspring is not so strong to drive it through it. Some time since, I cleaned an American watch that won a prize at Cawnpore, in India: the officers amused themselves by betting on their watches being kicked the farthest, and going the longest after the operation. The fine Swiss and English watches soon succumbed, but the American survived as usual, and is a good illustration of what Darwin meant by the "survival of the fittest," *i.e.*, best constituted to withstand the ordeal through which it had to pass; it was the strongest, and in a rough world the moral is obvious, be refined if and when you can, but always be strong.

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The Watch as a Compass.

LAST month one of our contributors called attention to an extract from *Truth* anent the above, and solicited opinions upon its validity. The answers received are very various, some saying "No," others "Yes"; others "Yes, if it were a twenty-four hour watch;" yet others, that it only holds good in the Northern Hemisphere; and still others, that it only holds good from 9 a.m. till 3 p.m. The most detailed account is one from an old correspondent, Mr. Ganney, which we now give. We have others which we shall probably publish, as we think there is more in this subject than strikes one at first thought. Mr. Ganney says:—

> "Using the watch as a compass is really the converse of using the sun as a watch to determine the true time of any place, or in taking the longitude at sea; the difference of time between which and Greenwich is converted into miles or degrees. If we can tell the true time by finding the position of the sun or fixed stars, having in our hands the true time, the distance from our true south or meridian line, which we call 12 or 0 o'clock, can be approximately

found by the hour hand. A twenty-four hour dial watch would always give 12 or 0 o'clock as true south, and the 6, 12, and 18 as W., N. and E. Mason's New World Clock, mentioned in last month's *Journal*, does this very well, and is, in fact, a map of the world revolving in 24 hours, and has 24 lines or meridians, spreading outwards like the spokes of a wheel, and has a 24 hours' circle fixed round it, with 12 o'clock noon in the south, 6 p.m. on right hand side, 12 midnight in the north, and 6 a.m. on left hand side, so showing constant world time for all hours of the day and night, the position of the sun giving the time correctly. It follows, the correct time will give us the position of the sun and the angle it forms with us; in other words, knowing where the sun is sure to be at any given hour, we can tell where we ought to be. About 12 p.m. it should always indicate home, sweet home, and a horizontal position of the watch wearer. I knew a Federal soldier in Cincinatti whose watch enabled him to find his way from the Rebel prison at Andersonville, and saved his life, as few left that prison alive, or returned to the Federal lines by 'escaping.'"

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A Timepiece with a History.

One of the most curious and interesting timepieces ever in Pittsburg is on exhibition in the W. W. Wattles' jewellery exhibit in the Exposition. It belongs to Ludwig Grosse, a well-known artist and musician of Pittsburg, who secured it while on a recent visit to Germany. The watch is probably the thinnest one ever made. It is not over an eighth of an inch thick, including glass and case, both of which are moderately heavy. Inside the inner case the works themselves, not thicker than a piece of cardboard, lie and tick away the hours as steadily and accurately as the latest, most approved movement made. The watch was made by one of the most famous jewellers in Germany for the Duke of Saxony, about forty years ago. It was afterwards presented by the Duke to Franz Liszt, the famous composer, who carried it for a number of years, and left it at his death to his favourite pupil, Freidheim. The wearer was a young man of jovial habits, and was frequently hard up for ready cash. During one of these periods of bankruptcy he pawned the watch with a friend who, after keeping it for a number of years in hopes it would be redeemed, finally sold it to Mr. Grosse, when he was in Germany last summer. The outside case of the watch bears the coat-of-arms of the Duke of Saxony, inlaid in enamel. The carving, both on outside and inner case, is exquisite. The gold in the case is of the finest quality, and the gauze-like works are set with the rarest kind of tiny jewels. The watch undoubtedly cost a large sum of money when it was new, and would still bring a big price if offered for sale. Mr. Grosse regards it as too much of a curiosity, however, to sell it, and will carry it himself as a timepiece.

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The Watch Trade of Switzerland.

The last British official report from Switzerland states that owing to the activity of trade during the past year, and to the greater demand for skilled workmen, the trade unions succeeded in obtaining a rise in wages. The increase thus caused in the cost of production was not, however, followed by any sensible rise of prices, and the profits of the manufacturers consequently suffered. They appear, however, to think that prices will now gradually rise, and that the increased cost of production will have eventually to be borne by the purchaser. Some anxiety is felt that the interest of the trade may suffer seriously from the fact that the United States and England are every year becoming more dangerous rivals in this field of industry, and that the demand for Swiss watches is falling off considerably in certain countries, notably in the United States and France. The returns for last year, however, taken as a whole, are very satisfactory. The value of the watches, &c., exported amounted to £3,949,728, showing an increase of £592,156 on 1888. The principal purchasers were Germany, £1,059,460, an increase of £400,000; Great Britain, £564,653, an increase of £112,225; and Austria-Hungary, £394,441, an increase of £37,895.

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CLEVERLY DUPED BY SWINDLERS.

A CURIOUS case of swindling has just come to light in Paris. The author of the scheme commenced by inserting the following item in the Paris newspapers:

> A marriage has been arranged between Mr. Thompson, a stockbroker of New York, and Miss Ellen Barber, the daughter of Rev. John Barber, formerly of New Zealand.

A few days later a man attired as a clergyman entered the shop of Madame Prevost, a jeweller in the Rue du Bac. He introduced himself as "The Rev. John Barber, mentioned in this paper," and showed a copy of the journal containing the notice. He then told Madame Prevost that the bridegroom to be was a very wealthy man, and expected to expend about £1,000 for jewellery. He asked her to bring a fine assortment of jewellery to his house in order that a selection might be made. He closed the interview by giving a very respectable address in the Champs Elysée quarter, and appointed an hour for the jeweller's call. Madame Prevost, of course, responded, taking with her jewellery valued at about £2,000. On arriving at the house of Mr. Barber a neat maidservant opened the door, and ushered the jeweller into the sitting-room, asking her to wait until she called her master. While waiting for the coming of her customer, Madame Prevost noticed that the furniture, while plain, had been selected with excellent taste, and that a pair of crutches had been carelessly left on one of the sofas. About this time Mr. Barber made his appearance, and began to talk good-naturedly of his intended son-in-law, who, he explained, had not arrived, but was expected every moment. Mr. Barber then tenderly referred to the crutches, and remarked that his wife was a cripple. He expressed his regret that the poor woman was unable to be present at their daughter's wedding. He suggested to Madame Prevost that while they were waiting the arrival of Mr. Thompson, he would like to show the jewels to his invalid wife. The deluded jeweller carefully placed her treasure on a silver salver which the maid brought in, in response to a call from the alleged clergyman, who with his own hands carried them away to the next room. A few moments later the maid returned and inquired the price of a diamond aigrette. She again disappeared, closing the door after her. Madame Prevost watched and waited in vain for the coming of Mr. Thompson or the return of the minister. The house was silent as the grave, and at last, becoming suspicious, the jeweller rang a bell. There was no answer. Finally she opened the door through which the maid had passed and discovered that the room was empty. The salver, however, on which her jewels were carried away, lay on the bare floor. She ran from room to room throughout the house, but Mr. Barber and the maid were nowhere to be found. The outside door had been securely locked, and the jeweller could not even leave the house. By the time she had succeeded in alarming the neighbours the thieves had effected their escape from that quarter of Paris. It was difficult to make the porter believe that the clever pair who had rented the parlour from him were not a clergyman and his daughter, as they had represented themselves. The thieves have not been captured.

Midland Jottings.

(By Our Own Correspondent.)*

I AM very sorry to have to announce the death of Mr. Harry Davis, of the well-known firm of Osmund Davis, spectacle-makers and general opticians, of Hampton-row. Mr. Davis, something over a year ago, was suddenly afflicted with throat and chest complaint, which, although no previous symptoms whatever had made their appearance, speedily developed into pulmonary consumption. From that time, I believe, he only visited his works once again, and then only for a few days, after which he had to remain at home, suffering severe attacks of the disease at intervals. At the advice of his medical attendants he tried a stay at Penzance, which extended over some weeks, and afterwards Bournemouth, but got very little better. During the last three months he resided at Borth, near Port Madoc, and was making arrangements to live at The Cape, as this was the only hope held out to him by the doctors, when a sudden attack of congestion seized him, and he died after some hours of dreadful suffering. His body was brought to Birmingham for burial.

THE trade loses a well-known and highly-respected member in the person of Mr. Davis. He was on extremely friendly footings with all his customers, and from London and the principal large towns letters of condolence have been received by his widow, all of them expressing in the highest terms the personal loss which the writers feel to have sustained. The deceased was only thirty years of age, and full of energy up to the time when he was taken ill. He was an extremely hard worker; in fact, I cannot recall another man whose energy and industry in his business is so great. Sometimes it was but too certain to the onlooker that such a state of high pressure could not last, and this, unfortunately, proved the case.

MESSRS. BENTON AND SHAW, of St. Paul's Square, have just issued a new illustrated sheet of copper and brass fancy goods, any of the designs on which will make effective show goods in any window. These metals, highly polished and burnished as they are, add very much to the appearance of a display of electro-plate. I have often seen silversmiths' windows looking like the "whited sepulchres" spoken of in the scriptures, and this because there is no colour to relieve the silver-plate therein. Among the designs I would call attention to the "hand wrought leaf" candlesticks in copper, brass, antique bronze, oxidised silver, or copper and iron. They are made in various patterns, some of them having brass scrolls and pillar or other mounts. A fine candelabra for three lights is also illustrated. It has hand-wrought leaves and scrolls, with spring candle tubes, enamelled red, white, pink, primrose, or plain polished shade holders, and a set of engraved glass shades to match the tube candle holders, or in plain opal if preferred. They are made in copper and brass, or all brass, and look very handsome. A pretty and cheap lamp is also shown, with brass or copper reservoir, with glass shades in various colours. This may be had also for hanging, as a frame and chains are supplied at an extra charge.

MESSRS. LIGHT AND WITCOMBE, of Augusta-street, are showing some very natty little articles, variously patented and registered to avoid imitations, which are having the extensive sale which their merit should command. All the goods they manufacture are of a novel character, and for this kind of trade the firm laid themselves out, when some three years ago they started business. The growth of the concern has been rapid and successful, and they have sold over a quarter of a million of one article alone, which still continues in great demand. This is the "Patent Adjustable Coin Mount" brooch, which has been evolved from the simpler and less complete article which the firm produced at first. It is made in a large variety of patterns, chiefly in hall-marked silver. It is claimed for it that it is the cheapest mount yet introduced, that it is the best finished and the simplest and most effective, and, from the specimens I saw, these claims are no vain ones, for the novelty is an extremely useful and effective little bit of work. The best thing about it is the fact that it does not injure the coin at all, for it is constructed with a double tongue, a double catch, and a double joint. The first tongue, or bar, secures the coin from falling out, and the rest of the piece is just the same as an ordinary brooch. It is, in fact, a brooch with the parts duplicated. It may be used for English or foreign coins, tokens, medals, pebbles, and other disc-like articles suitable for such a purpose, and, of course, the wearer can vary the article in the mount at will, without the slightest trouble.

THE other principal novelty of this house is the "Cardinal Newman" brooch cross, which I have previously mentioned in these columns; but I refer to it again now as there have been improvements introduced into its construction which will materially help its sale. The original "In Memoriam" articles were partly for the purpose of mementos, but the crosses have recently been supplied on their reverse side with a figure of Christ on the Cross, making a full cross with crucifix, and thus rendering it useful for the rosary. The crucifix has been made anatomically correct, the die for it having been produced by Mr. Moore, the well-known die-sinker of Pitsford-street. Besides the cross, the mementos take the form of a brooch of silver with a gilt medallion portrait of the late Cardinal, and this medallion is also used in a small Maltese cross of silver made as a pendant.

THE letter from Cardinal Manning, in which he acknowledged the presentation of one of the crosses which the firm forwarded to him, is worth quoting:—

> Dear Sirs,—
>
> I thank you truly, not only for your kindness in sending me the beautiful memorial cross of my venerable and dear friend, Cardinal Newman. I accept it as a very grateful testimony of your affection to him, and of your kindness to myself—for I see you have engraved my name also upon your gift.
>
> Friends of sixty years are not easily parted—and in this you have united us once more.
>
> Believe me always,
> Yours faithfully,
> Henry E.,
> *Cardinal Archbishop.*

Au reste the firm are busy with their 9-carat decorated gold brooches, which have little coloured ornaments in the shape of flowers and leaves soldered on, and these are really very pretty and effective. They are made by hand, filed up into shape, not stamped out in blanks from a press. Their 9-carat diamond and pearl brooches in various shapes and designs have a very good appearance, and run, in this respect, 15 and 18-carat pieces very close. I also saw a very pretty little silver medal with a gilt shield, which the firm are about to present to a local athletic club.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

I FIND in some directions jewellers are complaining of a falling off in their orders, but generally this is not felt at all, it being confined to one or two sections of the trade. The silver trade, for instance, is slightly affected by the fluctuations in the price of the metal during the last few weeks. The present quotation for bar silver, 49½d., is, however, considered not to be altogether unsatisfactory.

I AM very glad to see that the charge against Mr. W. Cook, of Hockley-hill, which was tried at Bradford, has been dismissed by the stipendiary. The whole thing seems to have arisen through Mr. S. Wilkinson, the Bradford jeweller. When the case came into Court this gentleman was quite unable to say by whom the rings in question had been supplied, and it was impossible to prove that he had bought them from Mr. Cook. On the contrary, it was proved that Mr. Cook had not supplied them at all. It is very satisfactory to find that there has been nothing in this affair against Mr. Cook but the fact remains that the rings were sold falsely marked, and they must have been bought from some one. It will be interesting to know if Mr. Wilkinson is able to help the authorities in finding out who really sold him these rings.

THE British United Clock Company have just been made the victims of embezzlement and robbery—as regards the latter, in two cases. The first was that of a clerk who had taken to betting. He was sentenced to six months' imprisonment. The other was their night-watchman, who betrayed his trust by stealing a dozen clocks and selling them under their price. He received his reward: three months' hard labour.

THIS Company have just placed on the market their latest novelty, it being "The 'Gnat' Thirty-hour Lever Time-piece." This has been patented, and will doubtless have a large sale. It is a pretty little timekeeper, the face only measuring about two inches in diameter.

MR. A. SCOTT, of Summer-hill-road, is making a specialité of white metal goods, and he has some very nice designs in match-boxes of this material, which come under sixpence each. A better quality of these are sold in morocco cases, containing half a dozen assorted patterns for 7s. 6d. the case. White metal alberts run very low. His nickelled "Dot" one-day clocks, including Bee, Wasp or Tortoise design, are also sold very cheaply. The stands are sold separately.

NEARLY all business in Birmingham was suspended from Christmas Eve till the following Monday, and many of the factories were closed for the whole week. Among the retail firms in the jewellery, watch and silversmiths' trades, who closed their shops on Friday and Saturday, the 26th and 27th, were Nathan and Co. of Corporation-street, William Pearsall of High-street, Swinden and Sons of Temple-street, and Wm. Illray and Sons of New-street.

THE Archæological Society of Birmingham have just published their transactions for the years 1888 and 1889. A paper of very considerable interest included in the volume is that by Mr. John Cotton, the architect, which will be of great value to all numismatists. It is entitled, "The Regal Mints of Tamworth, Warwick and Coventry," and is accompanied by drawings which prove that, as far as minting is concerned, the progress since the days of the "Rose-Noble" has been but slight.

MR. J. ASHWIN, of Spencer-street, has patented a very useful little article in the form of a swivel and watch-key. It consists of a swivel-hook which connects the watch and chain, and is combined with a watck-key and universal shackle.

SIR HENRY ENFIELD ROSCOE, M.P., F.R.S,,LL.D., D.C.L., the eminent scientist and member for South Manchester, delivered an address at the annual meeting of the Coventry Technical Institute last month, and took for his subject the value of technical education to the practical watchmaker. He spoke in high terms of Coventry work, works, workmen and workwomen, and said he could hardly imagine a pleasanter industry than that of watchmaking. He also referred to the high opinion held at the Government Observatory, Kew, regarding watches made at Coventry, and he congratulated the town on the fact that the conditions under which the staple trade was carried on were very much improved during recent years.

MR. SCARISBRICK has left the employ of the Coventry Watch Movement Manufacturing Company, and contemplates commencing business on his own account. When his withdrawal from the Company was made known, some of the workmen absented themselves, but as they were under contracts with the Company, they were compelled to return. In one instance a case came into Court, but was adjourned for a month with the understanding that it would drop through if things went on all right.

Guns of Gold and a Carpet of Gems.

MR. W. S. CAINE writes thus from India of his visit to the Maharajah of Baroda: "We were taken to the old palace, in the heart of the city, to see the treasure room. Two huge cheetahs, carefully muzzled, used for hunting bucks, were on the palace steps. The regalia of Baroda is valued at £3,000,000 sterling. We were first shown the jewels worn by the Maharajah on State occasions. These consist of a gorgeous collar of 500 diamonds, some of them as big as walnuts, arranged in five rows, surrounded by a top and bottom row of emeralds of the same size: the pendant is a famous diamond called 'The Star of the Deccan.' An aigrette to match is worn in the turban; then followed strings of pearls of perfect roundness, graduated from the size of a pea to that of a large marble; wondrous rings, necklaces, clusters of sapphires and rubies as big as grapes. The greatest marvel of all is a carpet, about ten feet by six, made entirely of strings of pure and coloured pearls, with great central and corner circles of diamonds. This carpet took three years to make, and cost £200,000. This was one of Khande Rao's mad freaks and was intended to be sent to Mecca to please a Mohammedan lady who had fascinated him; but the scandal of such a thing being done by a Hindoo prince was too serious, and it never left Baroda. We were also taken to see two guns, weighing 280 pounds each, of solid gold, with two companions of silver, the ammunition wagons, bullock harness and ramrods all being silver."

Sheffield Notes.

(By our own Correspondent.)[*]

BY the time these notes are in print the year 1890 will be a thing of history. It is natural, therefore, that this first paragraph should be of a retrospective character. The year that is past has fulfilled the optimist anticipations of it indulged in at its commencement. The silver trade has flourished like a green bay tree. The only source of anxiety on the part of managers has been as to how soon orders could be got off the books. In doing this they have had to work like slaves. Hard work of this kind, however, kills nobody. It is the feverish effort to produce something new in order to stimulate demand in a falling market which wears the life away. As it is, everyone may indulge in the relaxation which the season affords, with the satisfactory reflection that he has passed through as prosperous a year as the annals of the trade of Sheffield have been able to chronicle for more than a decade.

AS a consequence, probably, of the hopeful spirit which prevails, the only remaining plot of surplus land in Fargate, in connection with the improvement scheme, has been taken up, and will shortly be covered with buildings. The handsome block next to the Albany Hotel in the same street is rapidly approaching completion, and is a decided ornament to the centre of the town. Further on, the site of the new Town Hall is cleared of buildings, and across the open space thus created a fine view of St. Paul's Church is obtained, making one almost regret that the land should ever again be covered with even the splendid building which it is intended to erect upon it.

IT is perhaps not generally known that the outline of this same St. Paul's Church was a favourite subject of the pencil of Godfrey Sykes, who did so much in his time for the Sheffield School of Art. When a young man he was often to be seen in the early summer morning, before the traffic of the streets commenced, notebook in hand, sketching the fabric from different points of view. These he afterwards worked up into pictures, one of the most successful of which was a moonlight view from the now demolished Cheney-square, in which the picturesque dome showed up most effectively against a background of clear sky.

THE Council of the School of Art met the other day to consider the works sent in competition for the prizes awarded annually under the will of the late Alfred Chadburn. The subject for competition this year was a pair of wrought-iron gates with stone pillars and lamps suitable for a gentleman's mansion. The Prize Committee were much pleased with the general degree of excellence attained by the competitors, and awarded the three prizes as follows:—1st prize, £18, Launcelot T. Railton; 2nd prize, £7, Wm. H. Banks; and the 3rd, value £3, to T. T. Rackstraw. They were not, however, so successful in dealing with the drawings sent in competition for the prize offered by Mr. H. L. Brown for the best design for a 50 oz. silver charity cricket cup. The Committee did not award any prize in this competition, and, like wise men, did not give their reasons for withholding it. The outside public, however, will draw its own conclusions.

IF there is one spot in England more than another where a good cricket cup ought to be produced, it is Sheffield. We have the almost universal indulgence by our population in outdoor sports on the one hand, and the artistic skill of our silversmiths on the other. We do not, however, appear to be much more successful than our neighbours in work of this character. Most realistic looking stumps and bats and balls in all sorts of ungraceful positions seem to be considered the sort of thing to turn out. "They manage these things better in France."

A MEETING in connection with the Iron, Hardware, and Metal Trades Pension Society has just been held in the Cutlers' Hall, under the presidency of the Duke of Norfolk. Although it happens to have its headquarters in London, this society is looked upon as essentially a Sheffield society. When, therefore, its funds are low, as they are at present, the committee naturally turn to Sheffield as a place where they have a right to expect support. The assistance which the society affords to those who are unfortunate enough to require it is widely appreciated, and it is almost certain that the funds of the society will be materially augmented by this appeal to those who are in more affluent circumstances.

ALL tradesmen are more or less alive to the importance of "window dressing." Although jewellers, from the nature of the case, do not, like drapers and so forth, set apart one day in a week to the practice of this art, yet they are just as sensible to the fact that an artistically set-out window "draws." And, in truth, nothing is more pleasing than the sight of a tastefully-arranged jeweller's window, especially at night, when the electric lamps are lit. Townspeople, of course, now regard this spectacle as a matter of course, but for country cousins it has still the charm of novelty. The other night a couple from the neighbouring county of Lancashire were passing Mr. Eaton's shop in Singhill, when their admiration was excited by the brilliant display of incandescent lamps insinuated among the goods in the window. Thinking to please the children at home by taking back a present from Sheffield, Paterfamilias entered the shop, and asked the price of "one of these 'ere small lamps." I have no reason to believe that Mr. Eaton's assistants did other than explain the nature of the situation to their would-be customer, but it is certain they thought a good deal more than they said. They are not the sort of young men to allow a customer who wants to buy a small electric light to leave without supplying him with something which, from their point of view, is infinitely better.

THE smoke nuisance still engages a large share of public attention, and is talked about and written about as though its abolition came within the sphere of practical politics. So much is this the case, that a whole army of commercial travellers has descended upon the town, each representing a house which has an infallible remedy for the smoke nuisance. When one thinks upon the immense saving which the adoption of any one of these patents would be the means of effecting, one wonders that the smoke nuisance has existed so long. People of a highly imaginative order of mind are beginning to speculate as to the appearance of Sheffield when the everlasting canopy of smoke has been taken away. As this is a picture which no mortal eye has ever yet seen, the man who can describe it is not without talent.

THE turret at the corner of Eyre and Howard streets, forming part of the premises of Messrs. Walker and Hall, has for some time presented a comparatively incomplete appearance owing to the absence of a clock, for which it was evidently originally intended. This want has now been supplied, and a turret-clock, showing the time on three illuminated dials, has been erected, not only improving the appearance of the firm's premises, but conferring a great boon on the numerous passengers to and from the Midland Station who pass that way. The clock is an eight-day one, made on the pin-wheel escapement principle, with 3 feet 6 inch illuminated dials, and is fitted with automatic apparatus for raising and lowering the gas. It is the work of Messrs. R. and E. F. Rippon, who seem not only to be carrying on the business of their late father, but to have succeeded him in charge of the public clocks of the borough, a post which he held with honour for the last twenty years.

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[*] We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

LAST month an incidental allusion was made in these Notes to the change effected in the old "Bull Week" customs by the operation of the Factory Acts. This change has been mitigated this year by an important concession made by the Home Secretary in the operation of the Acts as affecting burnishers and finishers. The pressure of orders has been so great this year in the silver trade that several of the leading manufacturers have jointly made strong representations in the proper quarter, with the result above named. The consequence is that buffers, burnishers, and polishers have been enabled to work till 10 p.m. right up to Christmas Eve. This concession is not only a great boon to all workers in silver, but has greatly facilitated the execution of orders on the part of manufacturers.

NEW TRADE MARKS LAW IN SWITZERLAND.

A LAW has recently received the sanction of the Federal Council in Switzerland providing against the false description of origin. Article 18 states that indication of origin consists in name of the town, locality, region or country, which gives its reputation to a product. The use of this name belongs to each manufacturer or producer of the said town, locality, region, or country, as also to the buyer of these products. The affixing of an indication of origin which is not real is prohibited. According to the following article, the persons residing in a place reputed for the manufacture or the production of certain goods, who trade in similar products of another origin, shall take the necessary steps for assuring that the affixing of their mark and trade mark shall not mislead the public as to the origin of these products. Article 20 provides that an indication of origin shall not be false under the following conditions: (*a*) when the name of a locality has been affixed to a product manufactured elsewhere, but for the account of a manufacturer having his principal industrial establishment in the locality indicated as the place of manufacture, provided always that the indication of origin be accompanied with the name of the manufacturer's firm, or in default of sufficient space, of his deposited mark; (*b*) when it is a question of naming a product by the name of a place or of a country which, having become generic, indicates in commercial language the nature and not the origin of the product. The Republic is to be congratulated upon having passed a measure which will undoubtedly act as a preventative against commercial dishonesty.

Discovery of Opals in Western Australia.

THE West Australian colonists have reason to congratulate themselves upon the increasing development of their natural resources. A man named John Williams, who had just returned from Coonganada, reports finding opals within twenty miles of the gold-fields at Roeburne. He had to leave the spot owing to the want of provisions, but intended to return when the rainy season was over. Williams was one of the discoverers of the Little Hero Nugget, and has had considerable experience with opals in Queensland. He thinks that the present find will prove very valuable.

Our Letter from the Diamond Fields.

(By Vaalite.)

JAN 12 1891 U.S. PATENT OFFICE

AS I have never had the pleasure of sending you any news before, and as, so far as I am aware, your journal has contained only here and there a few scraps of the goings on in this promising locality, it will be necessary for me to go into a few details that are now looked upon as things of the past, in order that your readers may be able to understand how we stand out here just now. I do not intend to touch upon the political aspect of our country, as that would not be sufficiently interesting, although the phases through which we have passed during the last year are probably unparalleled in the history of any of our colonies. The part which will most concern and interest your readers, I suppose, is that connected with your trades—diamonds, gold and silver. You are well aware that a great consolidisation of mine properties was made through the unparallelable energies of Mr. Cecil Rhodes, our present Premier, with the object of limiting the output of diamonds, and of so improving the bad prices that rough was bringing us. This, as you are aware, has had the desired effect, so far as prices are concerned, but it makes a much greater difference on finished goods than on the rough. The first ill-effect, however, of partially closing the mines was to throw a large number out of work. These, however, soon turned their attention to the old *débris* which lie in great heaps all over the town and outskirts. It was often remarked that this stuff would pay to re-wash, as most of it was the refuse of the early days when dry-sorting was in vogue. The De Beers Company made arrangements by which a hundred respectable but needy washers could set to work on the old heaps thrown out by the old French, Central, and De Beers Companies, with the result of quite a new little industry springing up. Some of the washers employ four or five Kafirs, while here, there, and everywhere may be seen small groups digging, delving and sifting, with now and then a small hand-machine, or even a steamer, with the result of making from £10 to £50 a week, some of them.

Naturally this opened up a very complicated state of affairs, and facilitated the I.D.B.-ing to an alarming extent, because it now became so easy for a man to have been doing a little re-washing. To prevent this the De Beers Company have made arrangements with the washers on their properties to have the first offer for their stuff, and so far, I believe, they have bid up well.

There has been some remarkable finds lately; for instance, the British United Diamond Company have just found a fine 102-carat stone.

When the De Beers Company sold out in November the stones realised an average of 31s. 6d. per carat. But they have all their work cut out now, as even when the mines were in full swing, and men were comparatively scarce, they had to spend large sums of money on amateur detectives, who, out of sight, watched the operations of everybody. I knew a man who had a piece of ground, which be began to dig himself to see what it contained, and in case it should turn up trumps he did it before sunrise. He had not long gone on when one of the managers began to make overtures to purchase; a large sum was paid for it ultimately, and the man is sworn under penalty never to divulge exactly where it was. There have also been several others opened and closed in just as mysterious a manner.

Diamond digging has all that chance which characterises mining, especially river digging, which is very often an expensive job. The Vaal River Diamond Mining Company have had a meeting, at which it was reported that just as they reached the moment of success they had to stop for want of funds. It is a pity if, after having diverted the channel, and got out 250 loads of diamondiferous material, they do not carry the work further; but it is all a chance. I knew a gentleman, one of the last paid-out diggers from Du Toits Pan, who went to work up the river, and up to the present has not earned enough to pay his Kafirs' wages. Against that might be set the case of two young fellows who went at the same work, and upon uprooting some trees found diamonds literally by the handfuls. It is only about two months since they left here, and they have now returned and sold out for something like £50,000. A Mr. Martin also took from the bed of the Vaal the other day a fine 52-carat stone which has been valued at £10 a carat.

One of the best equipped prospecting expeditions has just left Vryburg for Mafeking, their destination being Mount Hampden, Mashonaland, under the auspices of the Premier Exploration Syndicate, under the leadership of Mr. Adkins.

One of the Vaal diggings, the Klipdam, seems to be doing well, realising £1,000 a week. At the last meeting of the Grosvenor Prospecting and Developing Syndicate, the chairman made the important announcement that "at 155 feet the hard blue rock became visible at one side of the shaft, and showed that we are just inside the pipe. The blue ground is separated from the hard rock by a layer of greasy substance, similar to that which I found in a similar situation in the workings of the N.E. Company's Kimberley Mine. I have tested the ground with a sieve, and found the usual diamondiferous deposit, consisting of carbon, garnets, mica, etc."

The Pole Diamond Company have also made a good report, with the effect of sending up their shares from 1s. 6d. to 4s. 6d. I recently saw a stone from Koffyfontein, which, although it only weighed 3¾ carats, £90 was offered for it. Messrs. Wallace and Bawden have pronounced this the finest they ever saw, and considering they are valuators to the De Beers Company, you can be pretty sure of its quality.

TWO REMARKABLE DIAMONDS.

We are indebted for the following to Mr. Lewis Atkinson, who is well known to many of our readers, and, since writing it, has left Kimberley for India on an expedition, in which we wish him all success:—

In October, 1889, a Dutchman, named Nicholas Wilhelm Pentz, came to the Detective Department at Kimberley and handed in a rough and uncut diamond weighing 87½ carats, alleging that he had received it about twenty years ago from an old sweetheart of his, who resided at Heidelberg, Cape Colony. Neither the giver nor receiver was aware that it was a diamond. Pentz, according to his story, appears to have kept this stone as a memento, and carried it about with him wherever he went. Being in poor circumstances, he managed to make his way to the River Diggings, in order to try his luck in winning diamonds. He arrived there in October, 1889, and was informed by some old diggers that the stone he had taken such great care of was a diamond of good quality, worth about £1,800. As stated above, Pentz then came to the Detective Department and requested a permit to sell the diamond, as according to the law no one is allowed to sell diamonds here without a permit from the Detective Department.

The chief of the department, however, very rightly refused the permit, pending inquiry into the story told by Pentz, and retained the diamond. In the meantime, the chief clerk of the Detective Department was despatched to the district in which the young lady who was supposed to have handed over the stone was last heard of. He found her residing on a farm and married to a respectable farmer. The whole circumstances of the case were narrated to her, and the actual diamond shown to her. She admitted that she knew Pentz in her girlhood; but she did not recollect having given him a stone such as the one shown to her.

Now comes the strange part of the story. The sister of the lady alluded to herein now put in a claim to the diamond, stating that she was the person who actually handed the stone to Pentz. She stated that she picked it up on her mother's farm, and asked Pentz to ascertain the nature of it. She had quite forgotten the circumstance until her memory was refreshed by an account of the diamond appearing in the local papers. Pentz denies her story *in toto*, and defies her to prove it in a Court of Law. The consequence of all this is that Pentz is bringing a friendly action against the Government to restore the diamond, whilst the sister here referred to is suing Pentz. The cases will shortly be heard in the High Court, Kimberley.

The diamond weighs 87½ carats, and has been valued at £1,800. It is of a decided rose tint; its crystallization is of the octahedron form, but of very rugged character. It has not the usual polished surface of other diamonds, but on all prominent surfaces is dulled or fretted, no doubt through being water-worn and coming in contact with other diamonds and stones. It has two patches of a decided brownish tint, but these are only on the surface. It is not a perfect stone, as it has about three flaws in it; but there is no doubt that a most perfect brilliant, pure of flaws, of a rose tint colour could be produced from it weighing about 37 carats. A piece weighing about three carats must, during its travels up and down the river, have been broken out of it, as the cleavage lines are so distinctly marked. It is about the size of a fairly large walnut.

The other stone was found in De Beers Mine about a month ago by a native. It was in two pieces—one weighing 19½ carats and the other piece 25½ carats. The remarkable thing about it is its shape, as, with the two pieces jointed, it measures 2¼ inches long, 1 inch broad, and three-quarters of an inch deep. It has crystallized more in the form of ordinary quartz, only instead of being sexagonal it is of the prism form, having only three sides. At the one end—the base—it has a flat cleavage plain on the slant, and there is no doubt that to make it a perfect crystal there is another piece, about three-quarters of an inch, that ought to be added to it, and which may be found yet in the sorting. At the other end, or top, it comes to a blunt point, and it is this piece that was found broken off. It is of a lightish brown colour. To anyone not thoroughly acquainted with rough diamonds they would say that it was a piece of brown quartz, as the cleaved or broken end would naturally form the base of the quartz, as though it has grown on the rocks. The coating is more like the river diamonds. It is valued at £2,000.

Scientific and Otherwise.

Advance Aluminum.

MARVELLOUS strides are being made on all sides with this remarkable metal. A short time ago two great difficulties stood in the way; firstly the knowledge of a cheap method of reducing it from common clays, of which it forms the base; and, secondly, the way to solder it. Such strides towards the realisation of both these requirements have, however, been, and are being made, that it appears that ere long it will be raised to the position amongst the elements long been claimed for it by some who have had an insight into its capabilities. We hope shortly to give a detailed account of all the methods at present at work.

A New Mineral—Sperrylite.

A DISCOVERY of great interest has recently been made by Mr. Francois Sperry, chemist to the Canadian Copper Company, of Sudbury, Ontario, of a mineral which analysts agree in regarding as an arsenide of platinum, which is altogether different from the manner in which platinum combines in nature usually. It is also interesting, as the localities of this rare and rising mineral are so very limited and quite restricted. It thus adds another to the almost inexhaustible list of America's minerals and metals. The mine is owned by an English Company, and we believe specimens of the new minerals have been sent over to this country. It is named after its discoverer.

A New Stone (?).

SEVERAL journals have lately informed us that a new stone may be seen in the French capital, to which they have given the name of *pierre Tonkinoise*. They claim that when faceted like diamonds it is a beautiful stone, especially the pure deep blue, to which a name cannot be assigned. It is deeper than azure, but more brilliant than sapphire; such a blue as artists struggle to portray at Capri, or at other parts of the Italian coast. Other specimens of the "pierre Tonkinoise" show a faint lilac, not so warm as amethyst, and another variety has a flame-colored tinge. At present we can scarcely think what this can be; certain it is that no known stone enjoys the qualities here assigned to this one, and, if it is true, we wonder we have not heard more about it. But unfortunately this is by no means the first "new stone" the French have had, a circumstance which calls to mind the fraud known as *rubasse*. This was described in most extravagant language at its advent, but it turned out to be nothing more than ordinary clear quartz made hot, and then dropped into a cold solution of cochineal, or whatever might be the desired color, which caused it to crack all over, the coloring entering into these cracks.

Pearl Fishing at Ceylon in 1890.

THE pearl fishing which has just been brought to a close has been very abundant, that is to say, the number of oysters was great, but the selling prices were very low. The Government apportions itself two-thirds of the oysters, which are sold by auction daily. The average price was twenty-five francs per 1,000 oysters; the prices vary from seven to thirty-two francs. In 1860, when the prices were exceptionally high, only 3,644,000 oysters were taken. The finest taken was in 1889, when the figure reached 40,969,000 oysters. In 1890 the number of oysters taken reached 33,682,000, but the prices fell. The best result was obtained in 1888, when twenty-two million oysters were sold on an average of 114 francs; the prices varied from sixty-three to 196 francs. The Government in 1890 collected for its share about 561,000 francs, from which it deducted about 125,000 francs for expenses. The pearl fishing in 1890 lasted thirty-four days, and 175 boats set out daily.

Volcanic Silver.

THE existence of silver in volcanic ashes is of rare occurrence. In the ashes of an eruption of Cotopaxi, in July, 1885, Mr. J. W. Malet proved the existence of one part of silver in 83,000 parts of ashes. In the following year the same investigator was able to add a second instance. In January, 1886, a violent eruption of Tunguragua, in the Andes of Ecuador, between 50 and 55 miles from Cotopaxi, took place, the eruption continuing at longer or shorter intervals up to November of the same year. The ashes thrown up by this volcano, which had been at rest for over a century, contained silver to the extent of one part in 107,200 parts of ashes. This appears, at first sight, to be only a very small percentage of the metal. But when it is considered what enormous quantities of ashes are erupted, and what a vast extent of area they cover after an eruption, the quantity of the silver thrown up with them must be considerable.

In a similar manner the quantity of gold proved to exist in sea water is, at first sight, too insignificant to think of; and yet, if we take the lowest figures given by Sondstadts, and taking the capacity of the oceans of the globe as given by Giekie, and the population of the world at considerably above figures usually quoted, we should then find enough to very nearly make millionaires of us all.

The New Opal Mines.

THE mines are located in Washington, near the Idaho line. The country in the vicinity of the claims already opened has been liberally prospected, but opals have not been discovered anywhere else. The first find was made on William Leasure's place in an old well. A Mr. E. C. Hall then found opals on land near by, and at once leased 160 acres for ten years for mining purposes. The opal ore is found in pockets at a depth of several feet, on a flat near a creek. Mr. Hall has succeeded in finding the precious stones at every point where he has prospected for them. The opals are embedded in hard rock of lava formation. The rock is full of air holes, formed in the process of cooling. The opals, in various shapes, can be seen all through the rock, and vary in shade and size.

Very similar, we should imagine, to the Mexican matrix, which looks very like a pumice, only not quite so viscicular and more yellow in colour. Much trouble is experienced with the water in the shaft. The blasting also breaks a great many of the crystals in the rock. It is probable that the Hungarian method of sawing the rocks out, as in marble quarries, will be adopted. The Hungarian matrix appears to be much harder than this. Specimens of opal in the rough state from near Moscow have been sent to the exposition by Mr. Hall. Specimens of this new find have been sent to Eastern experts, among whom is George F. Kunz, mineralogist for Tiffany & Co., New York City. Mr. Kunz replied in warm and promising terms, and requested that more specimens be sent him so that he could study the nature of the opal. A leading jeweller examined a piece of opal in Mr. Hall's cabinet and says it is worth from 11 to 30 dol. per carat in its rough state, which points to its being of exceptionally good quality.

Silver Mines in Russia.

IT is announced that recently large silver mines have been found at the Kouban sources in Russia. More than twenty deposits of silver and lead have been discovered, some of which have been worked in olden times, but in a most primitive fashion. The ore has been analysed, and has been shown to contain a large proportion of metal. Deposits of coal have also been found in the neighbourhood.

Discovery of Silver Ore.

A PROMISING discovery of silver ore has been made at the Gerdsjö mines Norway, at a depth of only 14ft. It is hoped that the find may bring new life into this undertaking, which was discontinued five years ago, after a great deal of money had been sunk in it.

Transatlantic Jottings.

Another Great Diamond Failure.

NEWS of another diamond failure reaches us since our last issue; not so heavy, it is true, as that recorded last month. It is that of Mr. Charles Magnus, of 18, John-street, New York, the liabilities being 75,000 dols. Mr. Magnus had only been in business six years, and started with a capital of 15,000 dols. He appears to have done fairly well, till recently a Mr. John Mason, of Fifth-avenue, got into his debt to 12,000 dols., which he refused to pay, on the ground of conspiracy between his salesman and Mr. Magnus in leading him into buying the goods. This having got noised abroad, Mr. Magnus, fearing a general swoop down from his creditors, regarded assignment as the best way for all to share alike.

Fresh Water Pearls.

SINCE the few lucky finds that were made in the fore part of the year in several quick-running rivers, everybody is on the look out for pearls, and everybody seems to be finding them. There are at the present moment a thousand people looking for pearls to every one similarly employed at this time last year, and report has it that some very fine ones have been taken.

"Watch Clubs Must Go."

THE war on the Watch Clubs in the States is increasing daily. They are declared illegal under the Lottery Act. However, we fear that will only convert the clubs into deferred payment systems, when the chance of losses are much greater to the proprietors, and consequently higher charges will be made. It is very difficult to make men either honest or thrifty by Act of Parliament.

Jewels on the Increase.

SPEAKING of diamonds, the other day a writer in the Cincinnati *Times-Star*, said:—

I saw at the Grand Union garden party at Saratoga what is said to be the largest single piece of jewellery ever made in this country. It is two and a half to four inches wide, and at least eight inches long. It was worn by the wife of the rich sporting man Hankins, of Chicago, and one of the most noted jewellers of the country tells me that it is worth more than 15,000 dols. It consists of a great butterfly with out-stretched wings, made of diamonds, emeralds, rubies and sapphires. It is the largest butterfly ever made, and it contains 200 diamonds. The butterfly has a body made of a great Hungarian opal, and the tail of the butterfly is of emeralds. This is fastened to a diamond necklace, and it rests just at the edge of the collar bone, with the tail extending down on the bosom of the wearer's decollette dress. Fastened to the body of the butterfly and hanging down below it is a great oval mass of gold and diamonds as big around as a door plate, which rests upon the chest and which extends pretty well below Plimsoll's line. The exact dimensions of this ornament are five and a half inches long by two and a half inches wide. The base is of solid gold and there is a blazing ring of seventy-six large diamonds around the edge. Upon the face of the gold door plate is Mrs. Hankin's monogram in diamonds, and the whole ornament weighs over a pound. Every time Mrs. H. breathes she lifts this 15,000 dols. worth of gold and diamonds, and every time she sighs this fortune goes down and then rises spasmodically upward.

Growing Outlets for Diamonds and other Gems.

A WRITER in a San Francisco paper calls attention to the following facts:—

A hundred men wear diamonds now to the one who wore them a year ago. Every other man you meet here has one or more diamonds on him, and there are a great many swells who wear diamond rings. I saw a tall, lean, florid-faced man from Texas flirting his hands about as he drank his Hathorn water at the spring this morning, and there were three diamond rings on the hand that held the glass. His necktie of white satin had a scarf-pin of a diamond and a dax-blue sapphire, and this was pulled down so far as to show an immense solitaire, which served as a collar button. I saw a boy of ten with three diamond studs serving as buttons for his shirt, and I see girls who are in short dresses wearing diamonds. One very pretty diamond ornament is worn by a brunette from the South, who has a rich, glossy wealth of jet-black hair. It is a diamond butterfly which she wears on her head, and which sparkles against its black background which a splendour which reminds one of the wonderful magnificence of the peacock throne of the Indian Mogul, Shah Jehan. This butterfly rests with outstretched wings, flat on the head of the brunette. It measures about two and a half inches from the tip of one wing to that of the other, and these delicate wings are made of many little diamonds, spotted with blue sapphires, red rubies, and green emeralds, so that they look like real wings pulled from the angelic plumage of some heavenly insect. The head is a great ruby, and the long tail and body, which extends between the wings and for two inches downward, is of the finest emeralds. The background of the butterfly is, of course, of gold, but these precious stones hide it, and it is so well made that, as it sparkles and changes under the rays of the chandeliers, it looks like a thing of life. It cost a fortune, but the girl has, I am told, an income of $25,000 a year, and she can stand it.

NEW CUSTOMS TARIFF IN FRANCE.

THE French Government has before the Chambers a new Customs tariff which will be discussed before the present treaty of commerce expires. The tariff is divided into two applications. 1st. Maximum tariff applicable to countries which have no treaty with France, and which refuse any concession in this tariff. 2nd. Minimum tariff, which will only be applied to countries which grant favours, either Customs or commercial, to France. The following are the articles of the tariff specially interesting to our readers :—

Jewellery.

	DUTIES (DECIMALS INCLUDED).	
	GENERAL TARIFF. FRANCS.	MINIMUM TARIFF. FRANCS.
Works in gold, silver, aluminum, platinum, and other metals, per 100 kilo	600.00	500.00
Imitation jewellery, per 100 kilo ...	600.00	500.00

Clock and Watchmaking.

Mounted articles, watches with gold cases, each	5.58	4.50
Watches with silver cases, each ...	2.50	1.50
Watches with common metal cases, each	1.75	1.00
Watch works without cases, and finishing without any trace of scapement or setting, each	.50	.40
Works more advanced, and unfinished movements, each	4.25	3.50
Wooden clocks for furniture, per 100 kilo	44.75	37.50
Other clocks, per 100 kilo	104.00	80.00
Tower clocks ,, ,, ...	13.00	10.00
Works mounted or unmounted, per 100 kilo	100.00	80.00
The same for edifices, per 100 kilo ...	65.00	50.00
Musical chimes, per 100 kilo. ...	62.00	40.00
Divers timekeepers, each	1.50	1.00
Gold cases, each	2.00	1.20
Silver or common metal cases each ...	.75	.50
Furnishings in their rough state, per 100 kilo	65.00	50.00

Stone (works in).

Precious stones rough or cut... ...	Exempt.	Exempt.
Agate rough	,,	,,
Agate polished, per 100 kilo	18.00	15.00
Rock crystal	Exempt.	Exempt.

Optical Goods.

Optical instruments, surgical instruments, chemical and laboratory instruments are exempt from duty.

	FRANCS.	FRANCS.
Spectacles, eye-glasses, magnifying glasses, per 100 kilo	200.00	140.00
Meerschaum articles, with or without cases, with or without amber tips, per 100 kilo	390.00	300.00
Objects in imitation meerschaum, per 100 kilo	200.00	150.00
Coral cut, not mounted	Exempt.	Exempt.
Coral, rough	,,	,,
Pearls, fine	,,	,,
Ivory, tortoise shell, mother-of-pearl, horn	,,	,,
Watch glasses, eye-glasses and optical glasses, rough, including the glass, per 100 kilo	20.00	15.00
The same cut and polished, per 100 kilo	160.00	149.00

* * *

THE clerk Andrews, charged with defrauding Messrs. Mappin and Webb of a quantity of silver and plated goods by means of a forged order, has been committed for trial.

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

(Continued from page 134).

The Hexagonal System.

The Natural Forms of Beryl.

THE next gem in the order of importance that crystallizes in the hexagonal system is the beryl; the varieties of which are formed upon their colour. From the darkest green up to deep sea-green they are called emeralds; from sea-green and sea-blue to white they are known as aquamarines; other hues, such as the deeper blues, the yellows, goldens, and a number of other hues and tints are known as beryls, prefaced by their hue, such as golden beryl, etc. Frequently the beryls occur of varieties of hues in the same crystal, commencing, say, a green and ending in a cherry red. They also are of enormous size, the largest of any stone that occurs as a gem; the hexagonal prisms attaining a length of 4 feet, and 2,900 lb. in weight; but these of course are not fine enough to rank as gems. The largest one I have ever seen of a fine quality was a prism about 10 inches long. Dom Pedro was reputed to have a fine aquamarine, as large as a calf's head, which weighed 225 oz., perfectly transparent and without a flaw. There are also some very fine uncut emeralds in various collections in this country. There is one in the cabinet of the Duke of Devonshire, a regular hexagonal prism 2¼ inches long. There are also some very fine ones in the cabinet of the Duke of Westminster; and one of extraordinary brilliancy and colour was in the collection of Mr. Beresford Hope. All of these are from the celebrated Muso Mines, near Santa Fé, where they occur in a crystalline limestone, often of the purest white, but often quite black from the carbonaceous material it contains. In either of these matrices the emeralds stand out bold and clear; usually their faces are somewhat striated longitudinally, and occasionally a little rough, but very often they are lovely and smooth and clear The crystals usually occur quite separate and single, but sometimes they line a cavity.

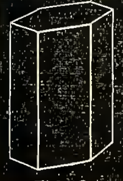


FIG 16.

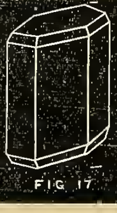


FIG 17.

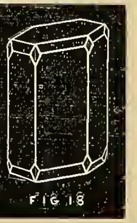


FIG 18.

The emeralds of the Urals, on the other hand, are usually huddled together in large masses, crossing and recrossing; the matrix being a micaschist. They are of inferior quality to the former, and occur in much larger size; some before me now are 8 inches long, and 1½ inches across the prism. In some of the latter regions greenish yellows predominate, here and there passing into greens, interspersed by crystals of opaque dull beryl. The crystals lie at all angles, some ending against the sides of others, many showing beautiful pyramidal terminations, or sometimes ending against a flat tabular crystal of mica. But although the beryl crystallizes in the same system as does the corundum, the form in which it occurs is entirely different. In the former we had occasionally, but only very occasionally, hexagonal prisms, usually terminating in either rhombohedral or elongated pyramids ; but by far more frequently—indeed, almost always—in doubly terminated elongated pyramids, more or less transversly striated, and furrowed with regular lines at irregular distances.

With beryls, on the other hand, we have no such double pyramids, and the prisms are usually terminated by low, obtuse-looking pyramids, rising like steps, and putting on complications unknown to the corundum. The usual and most simple form is the hexagonal prism, fig. 16 ; this we will suppose to be a prism of the first order, the lateral axis joining the opposite angles. If a pyramid be now built upon this, the faces of which are in the same vertical zone, it will be a pyramid of the first order. If we were to cut such a pyramid off, say, only a sixteenth of an inch above the prism, the plane so produced would be known as a basalplane, and although the faces of the pyramid left would be only a sixteenth of an inch long, they would nevertheless be pyramidal faces, no matter how short they were.

Fig. 17 shows such a figure with similarly truncated double pyramidal terminations. If now we were to plane off the angles of this hexagonal prism, we should put on faces of another hexagonal prism, which might be of exactly the same dimensions as the other, but from which it would differ in the relation of its faces to the axis ; in the first order the axis meet the angles or edges, in the second order they join the centres of the faces. This twelve-sided figure which results from this union, is, then, a hexagonal prism of the first and second orders combined ; these twelve-sided prisms frequently occur in beryls. The same operation might be performed with the pyramid, giving rise to pyramids of the first and second orders combined. Faces of the two orders are far more frequent in pyramids than in prisms ; frequently a simple prism of the first order is terminated, not only by a pyramid of the same order, but by one of the second also.

Fig. 18 shows the prism of the first order terminated by a pyramid of the first order, the solid angles of which are replaced by faces of a pyramid of the second order. It is also a peculiarity of these pyramids to occur at various angles to the perpendicular, and this may occur several times between the edge of the prism and the edge of the basal plane ; so that the prism appears to go up in a series of steps. Sometimes the pyramidal faces all keep of the same order as the prism, and rise all in the same zones, but at others they are accompanied by plains of the second order, which lie over the adjoining faces ; these two sets sometimes occur in one horizontal zone, but not in the next ; and appear again in the next, giving rise to very peculiar diamond-shaped faces, which one might think had been produced by cutting.

Reverting to the simple prism of the first order, sometimes a face occurs on either side of it, which may by development obliterate the hexagonal faces, resulting in a twelve-sided prism, known as a di-hexagonal prism. It will be seen that in this form the position of the axis will differ from those in the other twelve-sided prism, and that in the pyramid the shape of the triangles that make up the perfect form will be scalene rather than isosceles. These pyramids never occur perfect in nature, so far as I am aware, but planes parallel to them occur frequently, especially in beryl, and are sometimes called the *berylloid* for that reason ; when they are associated with planes of the foregoing, they give the prism the appearance of ending in a dome, facetted all over. I have seen a pyramid formed of these combinations, with sixty of these facets, and yet the basal plane has been large and well-developed. This basal plane or truncation of the pyramid is a very distinctive feature of the beryl, and serves to distinguish it from quartz of the same colour. All through this system we have spoken of the "basal plane" ; as a matter of fact crystallographers regard this vertical axis as infinite, and therefore speak of it as the *basal pinacoid*. In the engraving the crystals have an unnatural looking twist, but it must be understood that the base is at right angles to the sides.

In this system there are a great many hemihedral forms, with few of which, however, we need trouble. It will be remembered that a hemihedral form is one where half of the planes are developed at the expense of the other half, the result being that an eight-sided figure becomes a four-sided one, a six-sided one a three, and so on ; or the faces may only be developed alternately, as in fig. 15. If we take a hexagonal prism, and develop its alternate faces till they meet, we should get a triangular prism ; this would be the hemihedral form of the hexagonal prism. I have before me a large mass of beryl crystals, in which, owing to the different degrees of room they had, many of them have crystallized out in triangular hemihedral forms. Although it is very usual for the beryls to put on the pyramidal faces in a horizontal zone, or all commence at once, as it were, sometimes this is not the case ; before me is a prism, about 6 mm. in diameter, the pyramidal faces of which begin on one side 3 mm. before they do on the opposite, and 1 mm. before they do on the intervening face, so that it has stretched over two-thirds of the way across the prism before the opposite one commences ; and then, oddly enough, when it does commence, it starts a pyramid of the second order, giving the crystal a termination very similar to that which obtains in some quartzes—a sort of chisel-shape.

ERRATUM.—On page 133 of last number, line four from bottom, first column, transpose the words "first" and "second."

WE are informed that on the 1st of January Mr. Alexander Baume retires from business, and that in future the firm of Messrs. Baume & Co. will be carried on under the same style by Mr. Arthur Baume alone. The trade are well aware that no disadvantageous alterations in the business are likely to ensue from this change. Mr. Arthur Baume has long had the practical conduct of the business, and it has been with him principally that the customers of the firm have come in contact. We trust, and the wish is one that will be echoed by everyone who has the pleasure of knowing him and of appreciating his kindly disposition and businesslike method, that this gentleman may long maintain the position he now formally assumes.

The Markets.

THE IVORY SALES.

At the concluding sales of ivory for the year 119 tons were offered, 112 tons being disposed of in one day; this was from Bombay, Siam, Zanzibar, the West African coast, Egypt and the Cape, and included some huge mammoth tusks up to 135 lbs. each, found in a stranded iceberg in Siberia. There was also a fairly large quantity of walrus and seahorse teeth. Prices ranged from £20 per cwt. for the commonest sort to finest billiard balls £112 10s. The prices were materially affected by the McKinley Tariff Bill, which precludes ivory that has touched the saw, but admits the whole tusk free.

MOTHER O' PEARL.

Owing to the large takes recently, and the disastrous effects of the McKinley Bill upon the Austrian trade, finished goods will probably be offered at greatly reduced rates.

SILVER.

The up and down motion in silver continues: towards the latter end of the month the course was downward, reaching 54d., and on going to press on the 29th December it had risen to 57½d.

THE DIAMOND MARKETS.

At the commencement of December prices were perhaps on the whole a trifle lower, and buyers were rather more in number, so that stuff soon sold. Medium goods were most in demand in Paris and London, with a fair demand for rough and kopjes in Amsterdam, although at a rather lower price; but in the second week, owing to the numerous buyers offering less for finished goods, rough and kopjes were less in demand. There was a fair holiday trade both in Paris and London, with prices unaltered. During the next week, owing to the Christmas trade being over, buyers tried to influence the market by offering less, but offers were refused, so that prices practically stand as before. It is thought that large buyers, who have kept driving off buying, will be obliged to buy shortly to secure their spring stocks, and this will probably result in higher prices. At present there is nothing that points to a fall, the indications being rather the other way.

Mr. B. J. Round, of Northampton-street, Birmingham, who some months ago made a tour of the principal towns in Australia and New Zealand, has been induced to publish in pamphlet form a series of notes on the jewellery trade in those colonies. The colonists, he says, wear a great deal of jewellery. Gold is worn more than silver. The jewellery trade in Melbourne, protected by a heavy tariff, is prosperous, and every description of goods is produced. Mr. Round comments upon the seeming requirements of the colonies in the way of jewellery, and gives some advice as to the class of goods likely to find a market.

A beautiful tea and coffee service, supplied from the establishment of Mr. W. Williams, jeweller, Swansea, has been presented to the Rev. D. Bankes Williams, by the congregation of St. Mary's, Swansea.

Something New in Pins Wanted.

The constant cry—echoed on from the public to shopkeeper—from shopkeeper to factor—from factor to maker, is for something new in gentlemens' scarf pins. The regulation rounds and ovals, squares and oblongs, discs and horseshoes, appear at last to have quite lost favour, and pending the arrival of some quite new and taking idea, the sale of these articles has considerably diminished. Unfortunately for the maker, those who originate, and those who repeat, this cry have not the slightest idea of what they really require. Numerous new departures have been made, and many very pretty designs brought out, but, so far, nothing to secure a good and sustained run has appeared. The very term "new" is misleading, as immediately the old-established forms are relinquished, and some unconventional pattern submitted, the query is, "What is it meant for?" "What is it supposed to represent?" We would not infer that such novelties as have been presented have not sold at all, but simply that they have not caught the public taste to be demanded and re-demanded in various forms. Perhaps the next venture may hit upon the very thing required. The twisted wire coil pins sold fairly well for a time; also the pretty little bar pins with bead pearls and gems, of which there are several varieties in the market, but neither at present has found general favour.

As a matter of fact, the scope for design in a pin is very limited, especially now that small articles only are called for. Years ago, when size was a necessity, there was room to work, but at present, with such miniature forms, all detail of ornament is cramped out. Can any of our readers favour us with a few suggestions in this direction, or send us a few sketches that may be of use in stimulating the invention of our designers and workmen.

The Assay Office returns show that during the past quarter 60,000 oz. of gold-ware and 322,000 oz. of silver-ware were "assayed," compared with 50,000 oz. of gold and 285,000 oz. of silver in the corresponding period of last year. The total ware assayed during ten months was 193,000 oz. of gold and 1,100,000 oz. of silver, an increase of 62,000 oz. of gold and 200,000 oz. of silver over the corresponding returns for 1889.

A recent issue of the *Gazette* contains a notice condemning Pre-Victorian gold coin. Few of the coins in question are said to be in existence, since a large number have of late been exchanged at the Mint at their nominal value. It is ordered, however, that after February 28th, 1891, no gold coins of the realm coined before Queen Victoria's reign shall be legal tender within the confines of the United Kingdom.

Recently, Bailie Macgregor, of Perth, was entrusted with the commission for a handsome wedding present subscribed for by the employés of Messrs. Pullar, dyers, and intended for Mr. Rufus D. Pullar. The result was a very handsome tea and coffee and dessert service. The former was fashioned and ornamented in the Hindustani style, being a reproduction of the service of plate presented to the Prince of Wales when in India. In the dessert service were four elegant tripod stands having foliated uprights and corona in the Renaissance style with Vandycked glass dishes. The service was greatly admired.

ANSWERS TO CORRESPONDENTS.

J. T., Manchester.—Asks for a recipe for something to prevent windows steaming. We are sorry to say that so far as we are aware there is only one, and that is to keep the temperature the same on both sides of the glass, but how that is to be effected depends upon circumstances. First of all we must have some idea of what "window steaming" really is, which may be briefly described as follows:—Air is capable of taking up a certain amount of water, that amount varying according to circumstances—the higher the temperature the greater the amount of water it is capable of holding. Upon a decrease of temperature the water condenses, and is precipitated. When a volume of air at a given degree of moisture and at a given temperature is brought into contact with a pane of glass which approximates to the very much lower temperature that exists on its other side, the air is chilled at the point of contact by the glass, and not being able to hold the water at its reduced temperature precipitates it upon the glass. The air need not be saturated for this to occur; and, indeed, rarely is, so that by fanning into the window *fresh* air it may be made to reabsorbe the moisture. If cooler air be introduced by opening the shop door or fanlights the difference between the air out and inside is lessened, and the less precipitation goes on; and by causing it to circulate round the window the water is once more taken away by the atmosphere in as invisible a form as steam. The hygrometric state or amount of water contained in the atmosphere varies considerably. In very important cases, where it is absolutely necessary to preserve the dryness of the atmosphere, certain substances which are known as hygroscopic are employed, such as calcium chloride, unslaked lime, &c. There is one fallacy that must be guarded against that is often employed to the cost of the experimenter—viz., of trying to raise the temperature of the window (case), and so make it absorb the water or raise it to steam; this is only trying to warm the outside of your shop through a very bad conductor, or, we might say, air insulator.

J. R., Liverpool.—You are misinformed; the mean temperature given by most authorities for the places named are as follows:—London, 8·3° C; Brussels, 10·2°; Paris, 10·8°; Constantinople, 13·7°.; Marseilles, 14·1°.

S. T., Burslem; and J. B., Birmingham.—"The stones emblematical of each month" are as follows:—

January	Hyacinth
February	Amethyst
March	Jasper
April	Sapphire
May	Agate
June	Emerald
July	Onyx
August	Cornelian
September	Chrysolite
October	Beryl
November	Topaz
December	Ruby

S. T.—The address from whence to obtain models of celebrated diamonds is J. R. Gregory, 88, Charlotte-street, Fitzroy-square; we think he sells a case at about £12 or £15. The sketches of most of the models up to date were published either by the *Illustrated London News* or *Graphic* about ten years ago, when "The Great Diamonds of the World" was published. There have never been any photos of them published. Some eight or nine years ago one of the principal partners of the London Stereoscopic Company went into the matter with us; and although we have now the result obtained before us, which really gives outline, size, shape, &c., as well as is possible, it did not give satisfaction at the time, and the photographers abandoned the attempt as a bad job.

I. C., Shetland.—You are quite correct. Ice *is* nothing more than an aggregation of Crystals of Snow, the close contact of which makes the mass mechanically and optically continuous. If you cut a piece of ice parallel to its planes of freezing, and let the light (which is accompanied by heat) from any luminous body, such as the sun or a lamp, pass through it, as disintegration ensues a lens will reveal beautiful six-rayed crystals.

H. J.—We believe it is claimed that Hooke applied the balance-spring to the watch the same year that Huyghens applied the pendulum to clocks, viz., 1658.

A PHYSICIAN, known to many of our readers from the praiseworthy labours he has bestowed upon diseases peculiar upon various occupations, has asked us for information on this important subject in connection with our trades. We shall be pleased to publish all the facts bearing upon this all-important subject with which any of our readers can furnish us, and we are quite sure the good Doctor will put them to a use the benefit of which will be reaped by the calling.

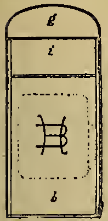
A NOVEL YANKEE CLOCK.

THE great clock which is to grace the lofty tower of the new marble building of the Penn Mutual Life Insurance Company in Philadelphia, Pa., is to be one of the curiosities of the city. It will possess a number of unusual features and will be in some respects unlike any other clock in the world. The peculiar effects will be apparent only at night. Instead of having an illuminated dial, with dark hands, as most large clocks have, the face is to be dark, with enormous hands of light. The hands are to be made of glass, over an iron frame, and illuminated with incandescent lights to give them the appearance of rods of fire. A curious method introducing the electricity into the hands without interfering with their movement will be adopted. The shafts on which they turn are to be used as conductors. The electric current will be fed to them from copper brushes, adjusted so as to touch the shaft without creating much friction. The huge dial will be of marble, with the numbers chiseled through. These numerals will also be illuminated by electricity. Two hundred incandescent lights will be used. It is not known how far the clock can be seen and the time read by the naked eye, but it is supposed that it will be a long distance. The lights are to supplied from the private electric plant of the building.

MR. BRADLAUGH has given notice of his intention to call at an early date the attention of the House of Commons to the laws relating to the hall-marking of gold and silver wares, and to move "That in the opinion of this House hall-marking should cease to be a compulsory institution."

MESSRS. TRUSLOVE & SHIRLEY, the late proprietors of this journal, have acquired fine premises at 143, Oxford-street, and are giving their attention to the publishing and bookselling business, in which we cordially wish them every success. They have just published a handsome and substantial work, very fully illustrated, on "Marylebone and St. Pancras: their history, celebrities, buildings, and institutions," which is not only produced in sumptuous style, but is characterised by a literary and artistic excellence which will ensure for the volume an extensive currency both within and outside the historical neighbourhoods of which it treats.

Illustrated Inventions' Record.

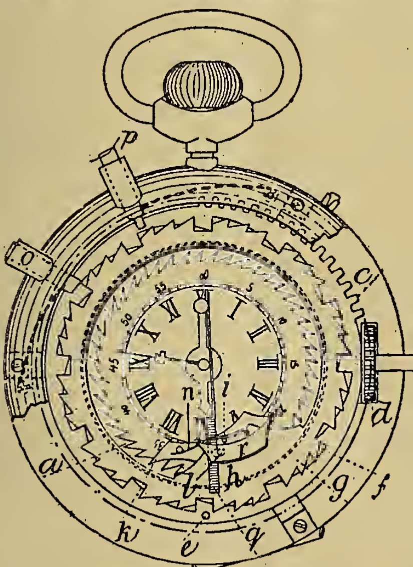


Spectacle-Case.—Louisa L. Eyre, Philadelphia, Pa.

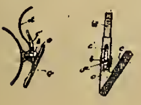
A multiple spectacle-case formed of successive flexible blanks of equal width laid together and all secured at or near their edges, the back and front being of a single piece, having holes *c c* and a hanging device inserted through the holes.

Watch.—G. F. Redfern, 4, South-street, Finsbury.

This is a repeater which, instead of giving audible signals, indicates to the touch, by means of strokes given by pins depressed by the finger. Round the dial is a fixed ring *a* of 48 internal ratchet teeth, corresponding to the quarter-hours. Outside this ring is a spur-toothed ring *c*, having two super-imposed ratchet rings *f*, *g*, with respectively twelve simple teeth and twelve sets of three teeth separated by gaps. The ring *g* has a cock *h* to which is pivoted a pawl *r* in the plane of the teeth *a*. The ring *c* gears with the wheel *d* on a milled head stem. This stem is turned till a bevelled spring pin engages a hole *e* in the ring *c*. A touch pin *o* is then pressed against the ring *f*, and the stem is turned in the opposite direction till a pin *l* on the pawl *k* meets a time-hand *q*, and the pawl is thrown on the teeth *a*. The shocks caused by the pin *o* riding over the teeth of *f* give the hours. A second reversal of the stem gives the quarters on a touch pin *p* engaging the ring *g*. In reaching and leaving the zero at twelve o'clock, the pin *l* is guarded from the hand *q* by a bevelled bridge *r*.



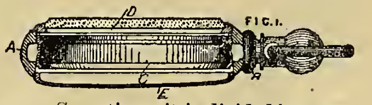
Sliding Guard for Eyeglasses.—Louis Alexander, Brooklyn, N.Y.



An adjustable sliding guard for eyeglasses (being offset), consisting of a V-shaped form with one side or flange perforated by an elongated aperture, said flange being so shaped as to allow it to be shifted up and down the end piece of the nose-spring, and to be there adjusted so that the axis or centre of the lens will always be met by the focal line of the eye. The adjustable sliding guard (being offset), consisting of one V-shaped piece presenting a perforated front flange *c* c^1 and a back flange *c e*, the back flange being so joined to the front one as to become either perfectly concealed or hardly noticeable when the eyeglasses are in use, and the guard being so adjustable as to keep the nose-piece at its proper height on the nose and at the same time bringing the focal line of the eye in a direction at right angles with the axis of the lens, substantially as described.

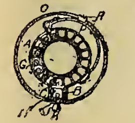
Watch-cases.—A. J. Boult, 323, High Holborn Middlesex.

The centre A is made wider than the pendant B or movement ring C, and the bezel D and back E screw or snap inside. The movement ring screwing inside may be adjusted to suit watch movements of various makers. Sometimes it is divided into two rings. The wide centre may be used when the bezel and back fit outside.



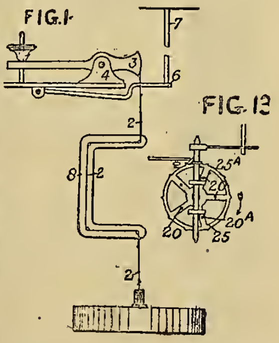
Match boxes.—E. Edwards, 35, Southampton Buildings, Middlesex.

Relates to boxes from which the matches are delivered singly, and in a lighted condition. The figure is a transverse section of one form of box. The cylinder A communicates by a longitudinal slot C with a channel B provided with a slide H actuated by means of knob K. Within the cylinder A is a fluted cylinder G carrying the matches and receiving a step-by-step motion from a pawl attached to a spring P, fitted between A, and an outer ring O. The igniting or rubbing plates, consisting of converging sheet-metal plates coated with rubbing composition, are placed at the open end of the channel H. In another form, cylinder G is turned by means of a knob secured to the end of the cylinder, its return being prevented by a spring catch. In a third form the cylinder G is rotated by a spiral spring under the control of an escapement.



Clocks, &c.—J. Oulton, 232, Otley-road, Bradford, and J. Edmondson, 36, Sunbridge-road, Bradford.

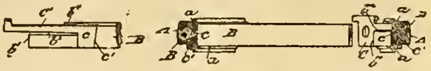
With torsion pendulums.—The torsion strip 2 is suspended from a lever regulator 3, pivoted at 4, and adjusted by a nut. It also passes tightly through a slot in a hinged curb 6, which gives compensation for temperature by its movements with alterations in the length of a metal strip 7. The impulse from the escapement is given to a stirrup 8 by a fork projecting from the anchor or impulse roller. The curb may be fixed and the compensation strip 7 may be attached to the regulator.



Escapement.—A duplex escapement, working like a chronometer escapement, is constructed with half as many pins 20 as teeth, and acts on two impulse rollers 25, 25a.

Watch-case Spring.—Peter A. Florimont, Brooklyn, N.Y.

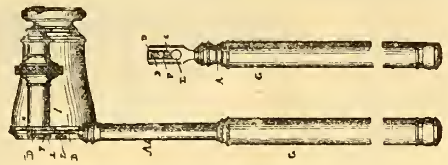
The combination, with the watch-centre, of a spring secured therein, said spring consisting of a body portion and a resilient portion, the said body and resilient portions being interlocked with each other by a tongue and groove



connection extending transverse of the end of the spring, substantially as set forth.

Opera-glass Holder.—LÉON WINTERDORF, New York, N.Y.

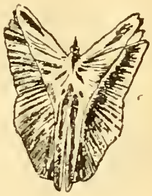
The combination, with an opera-glass having a recess formed on one of the cross-pieces uniting the lens-tubes, of



a rod, a projection on said rod fitting into the recess on the opera-glass cross-piece, and a spring-catch on said projection adapted to lock the projection in the recess, substantially as set forth.

Brooches, &c.—W. H. READ, Cliveden House, Maidenhead, Berkshire.

Constructing brooches, etc., from the bones of fishes, particularly of the skull of the cod fish. The figure shows such an article.



Pencil holder.—W. BRIERLEY, Halifax, Yorkshire.

FIG 1

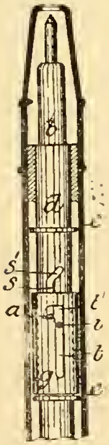
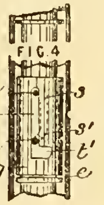
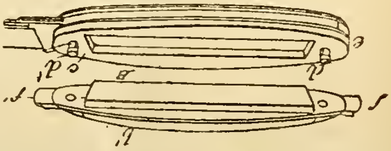


FIG 4



Gravity pencil holder.—Fig. 1 shows a section of the pencil with the lead within. The lead carrier *b* is free to slide in a fixed tube *d*, but its movement is limited by a pin *a* working in a slot *s*, *s*¹ in the tube *d*. pin also passes into a slot *t*, *t*¹ in a loose sleeve *g* which may move between the rings *e*, *e*¹, and is prevented from turning by the fixed pin *i*. On inverting the holder the carrier *b* and sleeve *g* descend, the carrier becomes locked in its forward position by the pin *a* being locked in the slots (fig. 2) by the continued descent of the sleeve. On again inverting the sleeve moves first releasing the pin *a* when the carrier falls within again. For adjusting or further projecting the lead any suitable device may be attached.

Pocket Knife.—W. BREDE, Paauhau Sugar Mill, Hamakau, Hawaii, Hawaiian Islands.



A whetstone is carried in the handle. One side of the handle is made in two separate layers *b*¹, *c*. The whetstone B is attached to one of them, and fits a hollow in the other. The two parts are normally held together by sliding catches *f*, *f*¹, engaging undercut studs, *d*, *d*¹.

Watch and Clockmakers' Pension Society.

ON Monday, December 8, a dinner in aid of the funds of the above society was held in the Royal Venetian Chamber of the Holborn Restaurant. Major Lambert, F.S.A., presided, and was supported by Captain Penton, M.P., Mr. J. Rowlands, M.P., the Hon. D. Naoroji (Radical Candidate for Central Finsbury), Rev. J. H. Rose, M.A. (Vicar of Clerkenwell), Mr. F. A. Ford, L.C.C., Mr. G. S. Elliott, L.C.C., Mr. J. Baxter (Treasurer of the Society). Amongst the general company were Messrs. R. Paget (Vestry Clerk of Clerkenwell), J. Ross, H. A. Atkinson, J. Figgins, F. G. Boulton, E. Havard, J. Gibson, Captain Potter, J. J. Goode, J.P., J. D. Spires, W. Pierpoint, F. G. Scheib, A. Daldorph, E. J. Thompson, S. Morris, G. Morris, W. Samnes, J. Pratt, L. Weill, Messrs. Goley, Woodman, Gaydon, Craighail, Solay, Walton, Kitson, Johnson, Fordham, Meek, and others.

The usual loyal and other toasts having been proposed and responded to, the Chairman proposed the toast of "Prosperity to the Watch and Clockmakers' Pension Society." He said that the society, which was now in the 71st year of its existence, was not as prosperous as it might be. They had paid their pensioners, but there were other contingencies to be provided for as well. If they travelled from Shoreditch Church on the one side to Kensington on the other they would be struck with the number of shops in which were exhibited watches and other articles of jewellery. He should like to see the names of these firms on their subscription list, but there was not one of these houses which had subscribed. He felt that the labourers who manufactured these articles, out of which they made profit, should be assisted in adversity, because no matter how propitious the circumstances were they could only earn a certain amount by their skill. They were all ambitious to carry a good English watch, surely then something should be done for the men who made them, when they grew old and were no longer capable of working. At the present moment the institution was languishing for want of funds. They should then consider how they could not only make the charity more known, but more respected and better supported. (Hear, hear.) They should succeed if they all put their shoulders to the wheel. (Cheers.)

Mr. Baxter, in reply, said that he felt indebted to the chairman for the able and kind manner in which he had proposed the toast of the society. To the gentlemen who had come in such numbers to support their chairman, he could hardly find words to express his gratitude. He (Mr. Baxter) had the honour of being treasurer of that society for many years, and he had also the honour of being Chairman of the Watch and Clockmakers' Asylum, in which he also took a deep interest. The Watch and Clockmakers' Pension Society was one of the best and most philanthropic societies, and he appealed to them all to help them to resuscitate it. Their chairman had shown his practical sympathy with the movement by giving them a donation of 100 guineas. (Cheers.) Captain Penton had subscribed 15 guineas, and altogether, as the result of the evenings proceedings, there would be an addition of about £300 to the funds of the society. On behalf of the executive, he sincerely thanked them for the support which they had given to the society. (Cheers.)

The Chairman, acknowledging the toast, said he thought that they would be perfectly justified in laying the claims of the Watch and Clockmakers' Pension Society before the City Guilds. If they decided on adopting his suggestion he should be most happy to coach them as to the best manner in which they should proceed.

Gazette.

Bankruptcy Proceedings.

Robinson, Claude, 49, Westborough, and late 2, York-place, Scarborough, jeweller and fancy dealer. Receiving order and adjudication.

Imperiali, William Giovanni, 102, Edgware-road, and late 38, Dewhurst-road, Brook-green, late jeweller's assistant. Adjourned examination January 15.

Hartmann, Theodore, 42c, Old Broad-street, 31a, King William-street, and 42, Forest-drive, Leytonstone, American novelty dealer. First meeting. Examination January 22.

Beever, Charles Bernard, 60, Upper Parliament-street, and 95, Derby-road, Nottingham, watchmaker and jeweller. First meeting. Examination January 9.

Sellars, John Henry, 1, Hall-gate, Doncaster, tobacconist and watchmaker. Receiving order and adjudication December 8. First meeting. Examination January 8.

Bradley, William Robert, 841 and 843, Attercliffe-road, 50, Attercliffe-common, and Worksop-road, all Sheffield, draper, jeweller, and furniture dealer. Discharge granted.

Dividends Declared.

David, Leon, 42, Hatton-garden, and 17, Lancaster-road, West Norwood, diamond merchant. First and final dividend of 1s. 8⅛d.

Hancock, Matthew James, 44, Market-place, Burslem, jeweller. First and final dividend of 4s. 2¾d.

Tourle, Thomas, 26, Grand-parade, late 19, Trafalgar-street, Brighton, stationer, dealer in watches, sewing-machines, and other domestic appliances. Second and final dividend of 1d.

Bills of Sale.

Green, Henry George (trading as G. Green and Son), 19, President-street, Clerkenwell, watch case manufacturer, engraver, and repairer; and Annie Green, his wife. In favour of Charing Cross Bank. Filed November 25. £45.

Nitzneder, Julius (and wife), 21, Grove-gardens (known as Villa Nova) St. John's-wood, and 35, Gosfield-street, Langham-street, Portland-place, and stables, jewellery merchant. Drawn in favour of Consolidated Company, Limited; filed December 11. £85.

Hart, Maurice (as trustee), 65, Grosvenor-road, Canonbury, South African merchant. Abrahams, Mark (as trustee), 45, Saudringham-road, Dalston, jeweller. Drawn in favour of Louis Joseph; filed December 12. £40. Absolute sale of household furniture at 45, Sandringham-road, aforesaid.

Herzog, Carl August (and wife), 19, Speldhurst-road, South Hackney, 9, Warwick-street, Regent-street, watch and clock maker. Drawn in favour of Alice M. Knight; filed December 12. £55.

Atkins, Emma (with the consent of husband), then of 299, Wheeler-street, Aston-juxta-Birmingham, now of 366, Lodge-road, Birmingham, wife of William H. Atkins, same address, jeweller. Drawn in favour of William Fletcher; filed December 18, 1885. Settlement re-registered December 11, 1890.

Davison, Alfred, 138, St. John-street-road, and workshop 13, Albemarle-street, Clerkenwell, jeweller. Drawn in favour of Charles G. Lodge; filed December 6. £50 of property at 138, St. John-street-road, aforesaid.

Taylor, Charles Henry (trading as Mary Taylor), 27, Eardley-crescent, South Kensington, and 83, Lillie-road, West Brompton, optician and wardrobe dealer. Drawn in favour of Henry Tyler; filed December 5. £30 of property at South Kensington, aforesaid.

Hurst, George Henry (and wife), 15, Titchfield-terrace, Albert-road, Regent's-park, dealer in jewellery. Drawn in favour of London and Westminster Loan Co.; filed December 5. £60.

Satisfaction.

Green, Henry George, 10, President-street, King's-square, London, and High-street, Bishop's Stortford, watch case maker; absolute sale of goods, etc., at Bishop's Stortford only. Drawn in favour of George Pidduck; filed June 18, 1888. £60, satisfied November 25, 1890.

Deeds of Arrangement.

Verity, William Colburn, 191, High-street, and Kensington-house, Cheltenham, and 131, High-street, Tewkesbury, clothier, jeweller, pawnbroker, and bill discounter. Unsecured liabilities, £12,064 19s. 3d.; net assets, £4,244 10s. 11d.

Smith, Robert, Church-place, Lurgan, jeweller. Secured creditors, £433 18s. 6d. Petition for arrangement; filed November 27. Unsecured liabilities, £456 1s. 6d; net assets, £406 1s. 6d.

Hermes, Christian August, 4, Garfield-street, Belfast, watch and clock maker. Confirmation order. A composition of 5s. in the £ on all secured and partly secured debts, by three instalments of 1s. 8d. each, at three, six, and nine months from date of confirmation, the first and second instalments to be secured by promissory notes of petitioner, and the last by joint and several promissory notes of petitioner and John Holmes, of Raphael-street, mineral water manufacturer, and Robt. A. Browne, of Church-lane, both in Belfast, watch and clock maker. Date of order: November 24. Unsecured liabilities, £543 17s. 8d.; net assets, £170.

Longman, John Mogg, lately of 163 and 165, Wandsworth-road, S.W., now of 127, Calabria-road, Highbury, N., late a pawnbroker, now a manager to a silversmith. Deed of release in consideration of a certain agreed sum being paid to the creditors in full discharge of their claims. Total composition payable—£1,597 8s. 4d.; filed December 4. Unsecured liabilities, £4,066.—*Creditors:*—

		£	s.	d.
Nathan, Benjamin	London	£300	0	0
Jones, Harry	,,	500	0	0
Newens, F. H.	,,	250	0	0
Cloud, T. F....	,,	200	0	0
Bennett, A. J.	,,	103	0	0
Girdlestone, C. F.	,,	2,712	0	0

Greening, Joseph, watchmaker, Market-street and Meir-road, Longton.—*Creditors:*—

		£	s.	d.
Cohen and Sons	Birmingham	55	0	0
White and Sons	,,	13	0	0
Ahronsburg, J.	,,	14	0	0
Wattis, G. F.	,,	17	0	0
Sloane and Carter	,,	25	0	0
Gilpin and Co.	,,	15	0	0
Goodeing and Son	,,	10	0	0
Marston, J. and H.	Coventry	10	0	0
Natila and Sons	Manchester	17	0	0
Riley and Co.	Nottingham	15	0	0
Cookson Bros.	Oldham	20	0	0
Willis, M., and Co.	Sheffield	10	0	0
Skidmore and Sons	Wolverhampton	11	0	0

Smith, Thomas Clayton, watchmaker and jeweller, 31, Fore street, Brixham.—*Creditors:*—

		£	s.	d.
Greenwood, John, and Sons	London	28	6	9
Skinner, John	Birmingham	133	2	1
Platnauer Bros.	Bristol	83	4	0
Smardon, R.	Brixham	16	10	0
Devon and Cornwall Bank	,,	164	0	0
Smith, W.	,,	100	0	0
Wurnecott Bros.	Plymouth	12	15	0

Sherwin, Julius Henry, 94, High-street, Barnet, jeweller. Composition of 10s. in the £, payable by three instalments, viz.: 2s. 6d. at 6 months, 3s. 6d. at 9 months, and 4s. at 12 months, from October 31st, 1890. Unsecured Liabilities, £365 12s. 8d.; net assets, £182 16s. 4d.—*Creditors:*—

		£	s.	d.
Unna, H. A.	London	19	19	4
Kirwan and Co.	,,	31	15	0
Davenport, A. J., and Co.	,,	126	4	9
Milleret, P., and Co.	,,	31	13	0
Loveridge, S., and Sons	,,	21	2	5
Mayer, S., and Sons	,,	14	5	5
Mayhew, E.	,,	26	0	0
Nordman, Jules	,,	44	10	6
Perrier, M. A.	,,	35	10	0

Allen and Coghill, 115, Spencer-street, Birmingham, wholesale jewellers. Partners: Harry Allen, 252, Park-road, Hockley, Birmingham, and Daniel Coghill, 90, Sachiehallstreet, Glasgow. Filed December 12. Unsecured Liabilities, £1,544 16s. 3d.; Net Assets, £590 4s.; Secured Creditors, £59 12s. 8d.—*Creditors.*—

		£	s.	d.
Abrahall, M. I. and Co.	Birmingham	150	0	0
Baker, E. and Son	,,	10	0	0
*Birmingham and Midland Bank	,,	59	0	0
Cramp, E. E.	,,	12	0	0
Collins, C. H.	,,	10	0	0
Cox, W. F.	,,	32	0	0
Downing, A.	,,	22	0	0
Durban and Co.	,,	39	0	0
Field, W. and F.	,,	28	0	0
Griffiths, A. G.	,,	51	0	0
Hayward, I.	,,	37	0	0
Hyde and Son	,,	80	0	0
Jones, R.	,,	38	0	0
Johnson, B.	,,	14	0	0
Kundut, —	,,	13	0	0
Knight, Joseph	,,	13	0	0
Levy, D.	,,	14	0	0
Loach, Bros.	,,	15	0	0
Marsh, E. A.	,,	24	0	0
*National Provincial Bank	,,	17	0	0
Oliver, W.	,,	16	0	0
Payton, C., and Sons	,,	107	0	0
Pellow, W. I.	,,	18	0	0
Perks, M.	,,	12	0	0
Richardson, E.	,,	31	0	0
Turner, M.	,,	103	0	0
Turner and Darby	,,	36	0	0
Vale, W., and Sons	,,	13	0	0
Westwood, B. W.	,,	30	0	0
Warwick, W.	,,	16	0	0
Whittington and Everall	,,	16	0	0
Kinder, T.	Coventry	293	0	0
Matthews, W.	,,	14	0	0
Vuille, Albert	Chaux de Fonds	28	0	0

Failure of a Scarborough Jeweller.

The Official Receiver has issued his report on the bankruptcy of Claude Robinson, jeweller, of Scarborough. The statement of affairs shows debts due to unsecured creditors, £171 7s. 7d. The bankrupt accounts for his deficiency as follows: Excess of assets over liabilities on the 13th August, 1890, £30; deficiency, £84 4s. 11d.; loss on carrying on business from 13th August, £72 4s. 11d.; expenses incurred in housekeeping since 13th August, bankrupt and wife (no family) £42. Robinson kept no profit and loss accounts, and having been adjudged bankrupt upon his own application, the stock will be offered for sale by tender.

Attributed to Loss on Trading.

The summary of accounts of W. J. Shaw, who failed early last month, being described as of 364, Euston-road, watchmaker and jeweller, has been issued. The accounts show gross liabilities, £2,249 14s. 11d., of which £1,617 7s. 11d. is unsecured; and assets £576 9s. 11d. The bankrupt states that, having acted as assistant to his father at Lincoln for some years, he, with a sister, worked the business as executors up to 1880, when a portion of the stock was sold, and the business was then tarted at the Euston-road. He attributes his failure to loss on trading, and to other causes. He has obtained advances on jewellery in order to meet bills falling due. He values his jewellery at £849, subject to realisation.

Meetings of Creditors.

The Senior Official Receiver presided over the first meeting of the creditors of Isidor Braun, who traded as a dealer in pearls and diamonds at Hatton-garden. He commenced business about thirteen years since without capital, and it would appear from the Official Receiver's observations that he has had to rely upon advances obtained from pawnbrokers, to whom he now owes about £10,000. The statement of affairs shows total liabilities £23,024, of which £9,981 are secured, and £11,262 expected to rank, the assets being returned at £7,266. It was stated that an adjudication of bankruptcy had already been made; and Mr. R. Babbidge, accountant, was appointed trustee of the estate, together with a committee of inspection. The Chairman announced that an important question was pending respecting the right of parties who had entrusted the bankrupt with goods on approbation to have them returned—whether, or not, in point of fact, the property in such goods had passed to the bankrupt. The motion was expected to be argued before Mr. Justice Cave.

The first meeting has been held of the creditors of William Henry Buckly Gardner, watch manufacturer, 5, Russell-terrace, Old Allesley-road, Coventry. The Official Receiver said, as the debtor had not been able to make an offer, he should proceed to realise the estate in the ordinary way, but if the debtor in the course of a few days could find a friend who would be disposed to buy the furniture and effects at a proper valuation, he would have an opportunity of doing so. The gross liabilities were £737 11s. 9d., of which £392 19s. were expected to rank for dividend, and the assets £144 15s. The estate lapsed into bankruptcy, with the Official Receiver as trustee.

The first meeting of the creditors of Charles Bernard Beever, watchmaker and jeweller, 60, Upper Parliament-street, and 95, Derby-road, Nottingham, was held at the offices of the Official Receiver. The statement of affairs showed liabilities £292 19s. 1d., and assets £84 5s. 5d. No creditors were represented at the meeting, but the Official Receiver stated that he had conferred with the principals, and the estate would be realised.

OBJECTS OF ASSOCIATION.

Mr. A. E. Newcomb, secretary of the Liverpool Watchmakers' and Jewellers' Association, writing on the subject of the work of the organization, says:—We shall render legal assistance to shopkeepers in our trades who should suffer from illegitimate contracts, and will prosecute persons disregarding the Merchandise Marks' Act or the plate licence. Shopkeepers and tradesmen are asking, "What benefits can be obtained by joining your association?" In the first instance, the fact of our being a combined body gives us that power which regulates the working of the trades. We will practically govern the entire profession locally, using our power in the interests of our members, and building up the constitution of our industry, till we shall be able to look forward to the return of better times, and the speedy advancement of our commercial position. We further appeal to our fellow tradesmen to join because we are endeavouring to prevent the spread of the "Shilling Watch Catchers;" we wish to improve our position from that of a cheap Jack, and we further want to see more social feeling among our fellow tradesmen. We are practically a Trade Association purely. We have no sick, funeral, or accident allowances, but we offer to protect journeymen who refuse to work for sweating firms, and also promote an increase in wages. This can only be done by organization and by the settlement of a fair list of charges. We further want to prevent dealers and peddlers interfering with our trade, and promote the encouragement of technical education with our apprentices, and support all home manufactured goods. All fair shopkeepers and tradesmen are offered the hand of friendship by the Association, and it is hoped that our roll of members will be considerably increased when our objects and aims are laid before them.

* * *

A singular case has been investigated in the Westminster County Court. The plaintiff, a servant named Birch, in the employ of a barrister, was induced by an advertisement to go to the shop of Messrs. Graham and Co., in the Strand, and purchase for 2s. 6d. an "Egyptian gold" chain, with which a "beautiful watch" was to be given away. The chain was found to be brass and the watch was discovered to have no works, while the hands were cast in one piece. Birch told her master about the matter, and he went to the defendants and demanded the return of the money, but they refused. The present action was then brought, and judgment was allowed to go by default. Special costs were granted.

The Watchmaker, Jeweller and Silversmith.

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The Merchandise Marks Act in the Future.

THE amount of good which the Merchandise Marks Act has done is not to be measured by the number of convictions obtained under its provisions. Some of the best stocks in the kingdom underwent such a purging at its inception as was perhaps without parallel. But, for all that, it never represented more than a half Measure. The Act made it unlawful to sell goods with false marks of either material, place of origin, or method of manufacture; but—quite unlike the enactment which makes it unlawful to distil whisky and then provides a man to see it is not done, and to prosecute those who do it—the Merchandise Marks Act leaves the case open for a common informer, or for anyone to institute and carry on a prosecution at his own expense. Had the matter not been followed up by the Watchmakers' Trade Association, the Act might a well not have passed at all. It was therefore very distressing to see the operations of the Association so crippled by a lack of funds, but at the same time it made us realise that it was an unjust thing for the Association to have to prosecute. When a law of the State is violated, the offenders ought to be brought to justice and punished by the State; and there can be no two opinions that in every way it would be much better for prosecutions to be in the hands of those who would be quite beyond the range of trade jealousy or fear. It was a satisfaction, just before the breaking up of Parliament for the Christmas holidays, to be officially informed that the Government were considering the recommendations of the Select Committee of the Merchandise Marks Acts, more especially with regard to a Public Prosecutor, who would immediately remedy the evils we have pointed out. The unanimous opinion of the witnesses before the Select Committee was that State prosecutions were absolutely necessary, or as Mr. I. J. T. Newsome, of Coventry remarked, "a Public Prosecutor would crown the Act." Mr. Rowson, of the Liverpool Watch Trade Association, made known a fact. that has several times been brought to our notice, viz., that foreign movements are still being sold as English; and at present the audacity of the offenders is correlated to the funds of the Watchmakers' Trade Association. The committee further recommend "that the solicitor to the Board of Trade, or the solicitor to the Customs, should prosecute in all cases affecting the general interests of the country, or a section of the community, or of a trade; there being in such cases no sufficient motive to induce any individual to incur the the expense, responsibility, or trouble of a private prosecution." But why should prosecutions be thus split up between two departments of the State? Remembering the adage, "Between two stools one falls to the ground," it must be said that we would much rather see prosecutions undertaken by a Public Prosecutor, upon the information of men whose business it is to see that the provisions of this Act are duly enforced, without any assistance from formal information laid by any person or body. So long as unprincipled men realise they have anything short of this to thwart them, so long will they continue in their nefarious actions.

The Plate Licence.

WE have received a number of letters since the abolition of the Silver Duty in reference to the licence question, and we must say that had many of our correspondents had extensive acquaintance with the trade in its various branches they would not entertain for one moment the opinions they now religiously hold. First of all, what is the licence? It is assuredly a very different thing from duty on plate. When you paid duty upon plate, you simply assisted to swell up the revenue of the country, not because you had a greater amount of it expended upon your personal comforts; on the contrary, you had nothing in return, only the elevation of your wares beyond the reach of many purchasers. But the licence represents a sum fixed to keep a thousand jack-of-all-trades from trespassing on a trade that took many years of hard work to acquire. It is absolutely certain that thousands are kept from dabbling in it by the price of the duty, and there are more convictions for it than we are aware of. Many a trader, too, is enabled to bear his share of local taxation much better than he would if the draper at the sell-all kept the articles which the law forbids him without paying a licence. A proper amendment in the law would be to make it illegal for anyone to sell any weight of gold or silver without a licence. We have heard a "hosier" boast of selling £1,500 of jewellery in a year without paying a licence; while a jeweller just close to him had to keep an immense stock after learning his business, and then could hardly keep his head before the wind. A certain amount of money is spent in jewellery every year, which ought to go to those who specially lay out their lives to understand the requirements of those who have it to spend, and not to those who do not consider for a moment what is needed, nor understand the quality or anything else of what they sell, or care so long as they make money. We sometimes try and picture to ourselves what trade would come to if we did away with hall-marking and plate licences. Every draper, stationer or oilman—to say nothing about those shops to which it is impossible to give a name—would "do a bit in jewellery," whilst unprincipled men, ever "on the cut" because "they all do it," would gradually get the quality lower and lower. In vain might we assure the customers that ours was such and such quality; there would be nothing to show the others were not! And with that almost innate love for a bargain that seems to lie down at the very root of every monetary transaction, from a big farthing's worth of sweets in the child to speculative stocks, nearly every one would flock to where the largest bargains were to be found.

New Way to Swindle Jewellers.

A NEW scheme to victimise retail jewellers has been devised in New York. It operates better than doctored diamonds, and the originator comforts himself with the belief that it is not within the pale of the law. A young man enters a jewellery store, and after pushing his elbow through the show-case begins to apologise to the owner for the alleged accident, and argues that the glass must have been very thin. When he professes the utmost sorrow for the ocurrence the jeweller demands reimbursement for his loss, but the man claims that he has no money with which to pay. As he speaks the victim notices a 20dol. bill peeping from the stranger's pocket, and in an instant has snatched it and is handing the man 17dols. in change, saying as he does so that he has deducted 3dols. for the damage. The swindler appears satisfied and leaves the store with a sorrowful expression on his countenance. Presently, while congratulating himself on the outcome of the transaction, the jeweller thinks that it suited his visitor too well and takes another look at his cash, and then discovers that the bill he has taken was one of 2dols. raised to 20dols. This game was recently successfully operated, and when arrested the swindler claimed that he had committed no crime, as the bill had been taken from his pocket. Perhaps the United States authorities will entertain a different opinion, as raising a Treasury note is counterfeiting.—*Ex.*

Notes About Town.

(By our London Correspondent.)*

The proposed Spectacle Exhibition. THE Worshipful Company of Spectacle Makers are now deliberating over the advisability of holding an exhibition of eye-glasses and spectacles. Let us hope that the venture will not be devoted to eye-glasses and spectacles exclusively, but that its scope may be extended to optical instruments generally. Already several influential members of the trade have been invited to attend meetings of the Company to give that body the benefit of their advice relative to such an exhibition, which we are sure would do much to stimulate the branch of industry concerned. If statistics can be relied upon, the particular branch indicated and which it is sought to elevate, ought not to be in a flagging condition, for we are assured that short-sightedness is greatly on the increase. It will be evident, however, from this effort, whatever may come of it, that these companies are by no means unmindful of the trades they nominally represent. I wish them every success in their undertaking.

* * *

Exceptional Cat's-Eyes. It appears a Moorman dealer—or, as we suppose he would call himself, a merchant—has been round some of the out-of-the-way corners of Ceylon for some time buying up valuable cat's-eyes, with the result that he has obtained a goodly number of these charming gems of more than usual importance. These are now finding their way into the market, and several of them run into four figures. Those of us who know the history of some of the large cat's-eyes, and remember how one set of three, for instance, were in stock eating up the interest of five or six hundred pounds worth of diamonds, by which they were surrounded for a number of years before they found a fair throat and neck to grace, can only hope that the new "finds" will turn over quicker than did their forerunners. Still, a fine cat's-eye is a marvellous thing, even when one understands its structure. As we gaze into the limpid, transparent, petrified honey—so homogeneous, so apparently structureless—and yet see that lively, silky, brilliant eye upon its upper edge, or the change of colour as we turn the stone side for side, we feel tempted to drop the hard cold facts of science, and attribute to it something that flavours more of the supernatural.

* * *

Moving with the Times. I recently had occasion to visit the old establishment of Messrs. King and Sons, 222 and 224, Goswell Road. Those who have not been there lately would be utterly unable to recognise the old place. I once saw a large pushing house put up a bill, "As busy as bees," but this establishment seemed to suggest more the idea of the motto, "As busy as an ant-hill." If one watches a hive of bees at work, a lot of going in and coming out, a lot of standing still measuring the angles of the cells will be observed; but with an ant-hill, on the other hand, everybody is at work visibly and at full speed. This latter illustration is the impression that one would gain here. New workshops have been added to an extent that bears a peculiar relation to what was formerly seen. New branches of manufactures have been added, and new show rooms fitted up. "We make all these things on the premises," remarked Mr. King, as he pointed to a case of exquisite morocco and silver goods, such as writing sets, jewel-boxes, etc. And looking round were found the home of a host of silver novelties that I had seen and admired about town the last few months, in silver barometers, calendars, gigantic bevel mirrors, photo-frames and the like. The electro and gilt articles, too, were equally worth the inspection of those who go in for this class of goods, and which we know is hard to get with any pretence to quality or finish. And it is always better to buy of a manufacturer than a factor, one profit at least being saved, and to obtain the goods fresher, which with this class of articles is very important.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

* * *

The New Form of Crescents. The conventionalised form of diamond crescent, which is almost a circle, sometimes three-quarters, but always more than a half, is fast dying out, and all the new ones are being made of that shape in which her lunar majesty reveals herself when about three or four days old. The straightening tendency even exceeds the natural, and long crescents of two inches in length may now often be seen which can lay little claim to curvature at all. When the old form of crescent is retained, a figure or some other object is usually introduced. A very effective crescent of this kind is one born in the French capital, where Diana sits carelessly in the diamond crescent with outstretched arms towards its horns. Her loose robes are sometimes in parti-coloured gold; a large part of her bust is exposed and enamelled, as are her feet.

* * *

New Appendages for Queen's Chains. The popularity of Queen's and Langtry's are by no means on the wane; indeed with the introduction of new appendages they might be fanned up to full blaze for a long time to come. A number of these balls have lately been introduced which suggest great variety. A new adoption of the enamelled egg with a chick peeping out is very effective, if anything of a pose is given to the fledgling. Curious, and at the same time very pretty, effects can be obtained by representing reptiles so emerging. A crocodile, for instance, cut from brilliant green crocodolite, just introducing himself into the world; or a snake, in the same action, turning itself round the egg. Even the toad, despite so great a descriptive genius as Shakespeare, who styled it "ugly and venomous," may, under the same conditions, be made to look very "taking," and, if carved from slightly milky quartz, it has a curious gelatinous semi-embryonic look that would be sufficient to satisfy that craving for things which some call "odd."

* * *

The New Butterflies. For some time one of the select large West End establishments has been making for Eastern potentates a large number of, perhaps, the most gorgeous pieces of jewellery ever made in the West. This fact ultimately leaked out and others began making the pieces, and we hear there is likely to be a run upon them. They are usually made of enamels to the colour of nature. The varieties chosen are those with eyed patterns, such as the "pale clouded yellow" and the "peacock." These are supplemented by heavy draws upon exotic species; and because the thousands of patterns which these present are not sufficient, the draughtsman makes up an infinite number best suited for the stones at his disposal. The gorgeous effects of these cannot be realised without seeing them, but they are usually hard; in a word, they do not adhere sufficiently to nature to make their effect pleasing. When we look through a collection of gorgeously couloured butterflies and moths, whatever colours are present, we can only admire. These colours somehow blend so beautifully, their tone is so charmingly uniform, and the effect produced so harmonious. Then there is an inimitable translucency—almost transparency—in them, only one step removed from coloured air: but with a thick, heavy glaze of enamel, the thickness of which is not only apparent but even exaggerated, which at once reminds us of overglazed pottery, or the artistic skill of some poorly civilised peoples. But here, nevertheless, lies open a grand vista for execution and detail, and a possibility of making a jewel what it might be—a piece of absolutely "Fine Art." Firstly, however, the enamels must be flattened, and the brilliancy of the gems will thereby be enhanced; and secondly, the heavy, clumsy, unnatural effect remedied. If this is done we may hope to see some of the finest specimens of fine art jewellery ever yet produced.

Beating the Record.

We are highly gratified to see that Messrs. Stauffer, who have for many years been so well known to all our readers, and whose "Atlas" lines have had such a popular run of favour, have been awarded the First Prize and Honours by the Council of State of the Canton of Neuchatel, not for merely scoring a high position, but for absolutely beating all records at the Observatory. We are glad to see such honours fall upon those whose name is amongst our "business words."

Mr. Herbert Blockley, successor to Lund and Blockley, of Pall Mall, has, in conjunction with Messrs. Lund, Blockley and Carter, jewellers and silversmiths, of Bombay, completed the Lord Napier of Magdala Memorial Challenge Shields, in solid silver, which are to be competed for annually by teams of British and Native soldiers at the Bombay Presidency Rifle Association Meeting. The British shield contains in the centre a medallion portrait in bas-relief of Lord Napier of Magdala, surrounded by the Collar of the Exalted Order of the Star of India, from which hangs the Jewel of the same Order, with the motto, "Heaven's Light our Guide." Above is a figure of Victory presenting laurel wreaths, and at her feet a scroll for the inscription. On either side of the portrait panels are heads of the lion for England, and the tiger for India, while above are implements of warfare and two flags, the British and the Queen's colour; two soldiers, one British and one Native, flank on either side an irregularly-shaped shield containing a "repoussée" subject depicting a shooting competition. The Native shield is of similar description, only with a slightly different inscription.

The Silver Trade.

Trade Prospects. IT has been remarked to us several times during the last week or two that silversmiths must have had a good run just before Christmas, to account for the clearance effected in many classes of articles. We wrote to five or six houses for things and were unable to get them. These were notably small fashionable novelties, toilet and writing table sets, and novelties which are suitable for wedding presents. There can be no denying it, that articles have now come to be considered absolutely indispensable which were unknown only two or three years ago, and we recommend our manufacturing readers to take up these lines now before they become too *cut*. We can only hope, however, in regard to silver, that the Hall-marking will be retained, to give the honest man a chance and block out the dishonest one. Perhaps after a quarter of a century, face to face with customers from Royalty downwards, we are able to realise how the public rely upon this guarantee, even when they are buying of the very first houses.

* * *

A New Forming Lathe. The Meriden Machine Tool Company, Meriden, Conn., advertise a new machine for all manufacturing that involves turning a large number of pieces of certain shape, especially the silver and electro-plate manufactures. For turning pepper, salt, and mustard-tops, etc., they claim that with one of these 3,000 to 5,000 can be turned out ready to plate in ten hours. The turning is done by a single motion of one lever, and requires no skill on the part of the operator. The first part of the motion of the lever tightens the chuck, and a further movement brings the forming tool forward under the work and turns it into shape, after which the tool drops sufficiently to clear the work during the reverse motion of the lever, which motion loosens the chuck and raises the tool at the proper time and in position for another cut, all operations being performed without stopping the lathe. It can be arranged to take both roughing and finishing cuts. One machine and one man will save the room and time of eight men and machines on hand work.

* * *

A New Dram Flask. All dram flasks, without very broad generalisations, may be regarded as varieties of kind. The stopper differs a little sometimes, and occasionally the bottom pulls off, and frequently it does not. Still, they are always the same old bottle. A novel and comfortable carrying thing would be in the shape of a York ham. The indentation formed by the string would mark the juncture of the stopper. This, if nicely struck, would look very well, and could be finished in several ways, including enamelling, introducing various brands, or anything else.

Mr. Philip Cohen, of Coventry, has presented a gold English lever watch to Mr. Edmund Mayo, his manager, on retirement after ten years' service.

Horological Notes.

ORIGINAL AND "CLIPPED."

Keeping Time. TAKING all things into consideration there are few more marvellous than the turret clock. When we look sometimes at the ponderous hands, 5 feet long with an average of five or six inches wide, presenting a surface of say three hundred square inches, and when we read from day to day in the meteorological reports the powerful pressure of the wind, or realise the obstructing influence of the driving snow upon a stationary object exposed to the full fury of its blast; now with both straining their hardest to retard the motion of the hands, and now to accelerate them, one is tempted to wonder how on earth the hands are able to keep time at all. It is with great pride, therefore, that we read the report of the Coventry Market Hall Tower Clock, in a week when the thermometer sank 25° below freezing.

Clock on signal. 1890.			s.	Daily variation. s.
Dec.	15	slow	0·4	0·2
,,	16	,,	0·7	0·3
,,	17	,,	0·6	0·1
,,	18	,,	0.6	0·0
,,	19	,,	0·8	0·2
,,	20	,,	1·2	0·4

We have seen reports on this clock, when the mean daily variation was even less than this. There are few clocks "timed" to such precision; there is no reason, however, to believe this is an isolated case. We know of an English regulator that stands in an outside position in a doorway that has not been altered for years, and is scarcely ever more than a few seconds out. We are frequently asked what is meant by "keeping time," and must confess it is a little difficult to say. The other day we heard a gentleman expressing great dissatisfaction at his watch not "keeping time;" it had been "gaining ever since he had it, and was now more than a minute fast." But upon talking to him of the weather, we find that since he had the watch he had been through Sweden and Norway to Russia; had twice crossed the Alps, had visited the Pyramids, and timed two bull fights in Spain; and considering that he has crossed from perpetual ice and snow to Egypt's tropical sun, we confess we felt more than ever unable to understand what may fairly be considered as "keeping time." Perhaps Messrs. Gueye can tell him, since the watch was one of their gold English keyless levers.

* * *

Pneumatics to the front. "Call these guards?" said a hoary-headed old railway servant in the course of conversation the other day. "Why, when I was a guard, guards *was* guards. Why, we couldn't stop a train going at anything of a pace under two miles. Half our time we were hanging over the side of the brake, and t'other half working the lever; but now you may see the 5.15 express coming along here, as though they had no thought of stopping, until it reaches the far end of the platform, when down he pops that new Westinghouse brake, and the train is brought to a standstill in a few yards. Yes, sir, them wind tubes is wonderful things." The latest development of these is a stop watch, by a Mr. Thos. Wraugham, of Rutland-street, Vt. The invention provides an attachment whereby the movement may be controlled by air pressure, a flexible tube extending from the watch and terminating in a bulb to be operated by the hand, or a mouthpiece, so that the watch need not be removed from the pocket of the wearer in timing a horse or the movements of athletes.

* * *

A New Electric Watch Lighter.

Numerous devices have from time to time been made for the lighting of watch or clock dials in the dark hours of the night. Messrs. Grant and Co., Faraday Works, Leicester, have just brought out one that has some special features of merit. The source of electricity is a Gassner dry battery, which may be kept in any convenient place, although no smell arises from its use, and it will last for years. The current is taken by a cord to a small divided case, with a minute incandescent lamp and reflector fixed in the rim, made hollow so as to take the watch, something like an enlarged outer metal cover. The light is made to appear by the pressing of a small stud. It is known as the Tempolux.

* * *

Demagnetizing Watches.

A somewhat ingenious, but at the same time simple, method has recently been described by Mr. P. Richards, West Medford, Mass., for demagnetizing watches. A horseshoe magnetic battery is turned poles upwards, or a strong electric current is sent through an ordinary horseshoe magnet or U-shaped bar of soft iron similarly fixed under some kind of support, about two or three feet over it, capable of supporting the weight of the watch to be operated upon (a lath from a bracket, or a metal eye or hook would do). A cardboard tray is now suspended by its four corners to a twisted thread, into which the watch is placed; the weight of the watch now causes the thread to untwist and so rotate the watch in front of the poles of the magnet. During the operation the thread is pulled up and so withdraws the watch from the magnetic field, thereby securing magnetization of all parts, or magnetic neutralization, or demagnetization: in a similar manner to that usually accomplished by far more complicated and costly methods, whilst few methods can be more universal in presentation than this circular and a gradually decreasing and vanishing motion.

Mr. John Paige, watchmaker and jeweller, of Tunbridge Wells, has shown himself to be a little more sagacious than some of his brethren. A well-dressed young woman recently waited upon him with a forged order for two or three gold watches. Mr. Paige, instead of supplying the watches, instituted inquiries, with the result that his pseudo customer now finds herself committed for trial on the charge of forgery.

After the departure of two well-dressed young women from his establishment, Mr. G. M. Crichton, jeweller, 18, Princes-street, Edinburgh, missed a ring and brooch, valued at £100. The suspected persons have since been arrested.

The premises of Mr. W. H. Hart, jeweller, Birmingham, were recently entered by burglars, and property of the value of between £300 and £400 stolen.

Watch and Clock Making.

Answers and Notes to Questions set at the City and Guilds of London Institute Examinations.

By I. Hermann,

Director of the Polytechnic School of Watch and Clock Making.

THE primary object of all examination questions is to ascertain the amount of knowledge and ability at the command of a candidate. Our intention in reproducing these questions and their respective answers is to convey instruction, since they may be usefully employed for preparation by other candidates for examination. They form a record of previous competitions, and are calculated to assist our readers in the acquirement of that information and knowledge, the extent of which it is the duty of the examiner to ascertain. The answers will be presented in two forms; the first to be framed in such a way as would, we will suppose, satisfy the examiner, and be of such an extent as to enable the candidate to get through his work in three hours, the appointed time for the examination. The second portion will be framed under the head of "Remarks," and here we shall endeavour to impart such information as appears expedient on the points to which the question relates, and in as concise a form as possible. Each question will be followed directly by the answer, but if anything appears obscure to any reader we invite correspondence, and shall be pleased to answer further questions. It will be expedient also that readers should have the matter well in hand for reference. To facilitate this, the separate sections will be indexed with Roman numerals, to distinguish them from those attached to each question.

I.—ELEMENTARY PAPER, 1880.

Question (1.)—What do you understand by the terms radius, circumference, depth, potence, escapement, recoil?

Answer.—Any straight line drawn from the centre to the circumference of a circle is termed a radius of that circle. The "circumference" is the line that encloses a circle. Any pair of toothed wheels, or a wheel and pinion whose centres are fixed in such relative positions that the faces or addenda of one engage with the flanks of the other, is termed a "depth." The "potence" is an auxiliary attachment on the lower side of the top plate of a frame watch, or the lower side of the pillar plate of a three-quarter-plate watch, for carrying the bearing in which the lower balance staff pivot runs. The "escapement" is that section of a watch or clock by which the rotary motion of the train is changed into the reciprocal motion of the moderator, and by which the work stored up in the weight or mainspring is transmitted to the balance or pendulum by alternate impulses, to restore the energy expended on resistance. "Recoil" denotes that motion of the escape wheel and train which is opposite to its normal directions, and which is produced by certain fixed properties of the escapement.

Remarks.—Few watch or clock makers are aware of the advanced mathematical principles that govern the work in which they are engaged. Watch and clock making involves the principles of motion, and motion is one of the three branches of mathematics. But the principle of motion cannot be understood apart from a knowledge of numbers and space, to which a knowledge of geometry is the indispensable key. For this reason the examiner very necessarily tests the candidate in the rudiments of geometry, as indicated by the two first items of this question. The remaining items are intended to ascertain the practical acquaintance of the candidate with his trade.

Question (2).—How is the minute-hand caused to rotate twelve times during each revolution of the hour-hand?

Answer.—The minute-hand is carried round by the centre pinion once in the hour. The cannon pinion, which is carried by the centre wheel pinion also, has a wheel as follower called the minute-wheel, whose pinion again becomes the driver for the wheel carrying the hour hand, and whose centre of motion is the cannon pinion. The number of teeth and pinion leaves are so arranged that—

$$\frac{\text{Cannon}}{\text{Minute wheel}} \times \frac{\text{nut}}{\text{hour wheel}} = \frac{1}{12}$$

Remarks.—The answer could also be inverted, when 12 would, of course, be correct. If in the first case the minute-hand is taken as the unit of motion, the rate of motion of the hour-hand is $\frac{1}{12}$ of the former. Inversely, if the hour-hand is taken as a unit of motion, the rate of motion of the minute-hand becomes equal to 12; so that whatever number of teeth and leaves are given to the wheels in question, the product of these ratios must either be 12 or $\frac{1}{12}$. Numerical example: Cannon pinion = 14, minute wheel = 32, minute nut = 12, hour wheel = 63, thus

$$\frac{14}{32} \times \frac{12}{63} = \frac{1}{12}$$

$$\text{Conversely} \quad \frac{32}{14} \times \frac{63}{12} = 12$$

Question (3).—A lever watch has the following train:—Centre wheel 80 teeth, third wheel 60 teeth, pinion 10, fourth wheel 54 teeth, pinion 8, escape wheel 15 teeth, pinion 6. Determine (*a*) the number of revolutions of the fourth wheel in an hour, and (*b*) the vibrations of the balance in the same time, showing the stages of your calculations.

Answer.—Let (*a*) x denote the number of revolutions of the fourth wheel in an hour, thus

$$(1) \qquad x = \frac{80 \times 60}{10 \times 8} = 10 \times 6 = 60$$

Again, let (*b*) x_1 denote the number of vibrations of the balance in one hour, thus

$$x_1 = \frac{80 \times 60 \times 54 \times 15 \times 2}{10 \times 8 \times 6}$$

$$x_1 = \frac{8 \times 15 \times 9 \times 15 \times 2}{2}$$

$$(2) \qquad x_1 = 8 \times 15 \times 9 \times 15$$

$$x_1 = 120 \times 9 \times 15$$

$$x_1 = 1080 \times 15$$

$$x_1 = 16200$$

$\therefore$ Number of vibrations per hour=16200

Remarks.—In train calculations it is mostly convenient to start with the centre wheel as a unit; that is, as making one rotation then the number of rotations of the third wheel will be

$$= \frac{80}{10} = 8$$

Likewise, the number of rotations of the fourth wheel to each one of the third wheel is

$$= \frac{60}{8} = 7\tfrac{1}{2}$$

But the third wheel makes eight to one of the centre wheel, so that the fourth wheel makes

$$8 \times 7\tfrac{1}{2}, \text{ or} = \frac{80}{10} \times \frac{60}{8} \quad \text{as set out in (1}$$

or 60 rotations to one of the centre wheels. The number of rotations of the escape wheel for each one of the fourth wheel is likewise

$$= \frac{54}{6} = 9$$

but the fourth wheel makes 60 rotations, hence the scape wheel makes 60 × 9 = 540 rotations for each one of the centre wheel. Lastly, the balance makes two vibrations for each tooth of the scape wheel, hence the number of vibrations of the balance for each rotation of the centre wheel is 540 × 30 = 16200. It will not be difficult for the reader to see that this could have been given in one statement as in (2). It is necessary generally to represent the unknown quantity by some symbol, and it is the universal practice to use x for this purpose.

Question (4).—How is it that the movement of a pendulum clock is maintained, although it is unprovided with a balance spring, which is essential in a watch?

Answer.—To set a clock in motion the pendulum has to be moved a certain distance from its position of rest, which is vertically below the centre of suspension. Thus the pendulum has a *potential* energy. When it is set free the potential energy is converted into kinetic energy at its lowest point, by reason of which it rises again on the other side until its kinetic energy is again converted into potential energy. Potential energy is due to the work done against gravity, and kinetic energy is due to the work done by gravity on the pendulum. Thus gravity acts on the pendulum, and alternatively the pendulum against gravity, and in effect this is identical with the elastic force of the balance spring in a watch.

Remarks.—The term "potential" is used to express the effect that a body is capable of producing by reason of its position, and "kinetic energy" denotes the effect a body can produce by virtue of its rate of motion.

Question (5).—Why is there no maintaining power in a going barrel watch?

Answer.—In a fusee watch the spring is wound by a force which acts in the opposite direction to that of the spring, so that during winding the algebraic sum of the pull of the spring is negative, and therefore a secondary appliance has to be used to keep the watch in action. In a going barrel watch the spring is wound by a force which acts in the same direction as the pull of the spring, therefore the pull of the spring is supplemented, hence no secondary appliance is needful.

Remarks.—In a fusee watch the spring is wound from the outside, therefore its pull is reversed, because the pull of the inside eye is useless. In the going barrel the arbor is rotated, which is in the direction of the pull of the spring. The term "algebraic" is equivalent to difference. The term "negative" generally is used to denote the way of motion of one point in contradistinction from that of another.

(*To be continued.*)

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Messrs. Fattorini and Sons, Bradford, were entrusted with the manufacture of a golden key used by Sir Albert Rollit, M.P., to open the new Conservative Club at Keighley. The design was original and quite equal to any previously produced by this well-known Yorkshire firm. The bar of the key bears the crest of the recipient, and the reverse the inscription, "Presented to Sir A. K. Rollit on his opening the Keighley Conservative Club, January 26th, 1891." All the heraldic decorations are in the finest enamels.

We are glad to see Mr. Abbott's lectures well attended. We notice that Hatton-garden, the manufactures and the lapidaries are well represented. Many of our contemporaries are reporting the lectures, and others are making copious extracts.

The United States Consul at Kingston, Jamaica, notifies that a good trade might be opened up with the natives in clocks and watches.

Midland Jottings.

(BY OUR BIRMINGHAM CORRESPONDENT.)*

THERE is a falling off in business to report this month, which is due to something besides the naturally slack time after the whirl of Christmas orders. Compared with January last year I find that trade is much less brisk, and manufacturers' reports are slightly discouraging. This is particularly the case with the home trade, and it may be traced partly to the fact that for some time shippers have been experiencing a considerable falling off in business, and manufacturers who have been in the habit of supplying them have flooded the home markets with their goods, chiefly in silver and 9-carat gold. This has resulted in driving some classes of manufacturers into the electro-plate fancy trade, which the electro-platers have allowed to slip from their hands. There are now signs of them waking up again, and there will therefore be this added factor in competition.

I AM sorry to say that two more deaths have to be recorded this month, and both of them this time in the jewellery trade, and both suicides. The first is that of Mr. C. M. Turner, of the firm of Turner and Darby, of 26, Regents-place, for many years a goldsmith and manufacturing jeweller. The circumstances attending the death of this gentleman were quite of a romantic character. He was staying at the Hôtel Bertrand, Paris, and telling his fellow lodgers he was hastening to Madrid, to escape the detectives who were on his track, because he had been selling falsely-marked goods. These statements were followed by his death by his own hand. It appears that his affairs have been in a very bad way for some time, and both at the business premises and at his private house the bailiffs were in possession. His effects are to be sold to pay his debts. His widow and child are left badly off, but, as far as I can ascertain, his statements to the effect that he had been selling spurious wares have no foundation in fact.

MESSRS. C. WESTWOOD and SONS have just issued a new illustrated price list of match-boxes and cigarette-cases of tasteful design, which are bound to find a ready sale nowadays when such things are so greatly in demand. Messrs. Westwood, whose address is 14, Hall-street, will be glad to forward a copy of the list to retailers, who will do well to send for it and keep it handy.

THE late Mr. E. H. Rawlins, of 16, Warstone-parade, killed himself in bed early in the month. He was very determined about it, for he locked the door of the room, and when the policeman arrived it was some time before he succeeded in forcing it and getting into the room. Meanwhile the other occupants of the house were in a very excited condition. The cause assigned for this suicide is falling off in business, which must have been great indeed, if there was no further reason.

MR. F. J. GARDNER presided at the first annual dinner of the *employés* of the English Watch Company on the 10th ult. The dinner was held at the White Horse Hotel, the well-known house for trade dinners in Congreve-street. A very good programme of music was provided, and a number of toasts were proposed. Mr. Henry Griffith, jun., chairman of the company, responded to Mr. Osborne's "Success to the English Watch Company," and remarked on the success which had hitherto attended the trading of the concern. He said that trade was good, and the orders on hand necessitated an extension of premises, which was now being proceeded with. Mr. John Bragg, one of the directors, also spoke, admonishing the workpeople to remember the quality of the goods they made as well as the quantity, and this little admonition he called "the two Q's."

MESSRS. AHRONSBERG BROTHERS have just issued a useful little list, which should be in the hands of all retail jewellers, for the firm have made a point of quick despatch, and almost anything of an ordinary character may be had from them at the shortest notice. In addition to their wholesale department, they have an extensive jobbing business, and they have dubbed their premises at 37, Albion-street, "The jobbing house of Birmingham."

MR. F. DERRY, of 11, Hockley-street, Birmingham, has introduced a really effective substitute for real plate in his "Royal Standard Victoria Silver," which he is using extensively in the manufacture of spoons and forks. It is claimed for the "Victoria Silver" that it surpasses all other substitutes for sterling silver.

MR. G. PLATNAUER has relinquished his partnership in the business of Platnauer Brothers, of St. Paul's-square and Ludgate-hill, Birmingham, and also of Bristol and Chaux de Fonds, Switzerland, jewellers and watch and clock manufacturers.

A NOVELTY in tools is that brought out last year by Messrs. W. Dixon and Son, of Newport-street, Walsall. It consists of pincers and nippers, the special features of which are, the cutting plates are capable of being easily detached when worn out and broken, and a thumb-screw which is designed to regulate the "set" of the jaws and handles, so as to prevent the former meeting and the latter becoming strained and bent. It is recognised that in an ordinary pair of nippers or wire cutters the jaws are worn by reason of the fact of their contact with each other. This is obviated by the adjustable screw. In addition to this, however, best steel jaws are now used with wrought-iron handles, and this is accomplished in this patent, by having the jaws separate and attached to the iron portion by screws, and this fixing is readily done, so that the old jaws may quickly be replaced, and the expense of having an entirely new tool obviated. Strong steel wire is easily cut with this tool, which an ordinary nipper will not touch. It should be of great use to all workmen engaged in the jewellery and electro-plate trade. It is, of course, supplied in all shapes and sizes.

MR. GEORGE MASON has removed his electro-plating and gilding business from No. 23 to No. 86, Vyse-street.

MR. H. D. KENDALL and Mr. T. R. Roberts, who recently traded as metal agents and brokers, under the style of "T. R. Roberts," have just dissolved partnership.

MR. PHILIP COHEN, of Coventry, has presented Mr. Edmund Mayo, his late manager, with a valuable gold watch, "as a mark of appreciation and esteem for faithful services on his resigning the position of confidential manager" in Mr. Cohen's works. Mr. Mayo is going into business with Messrs. Hotchkiss and Meek, who will trade as cycle manufacturers. He was manager for Mr. Cohen for more than ten years.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

Sheffield Notes.

(By our own Correspondent.)*

IT is my painful duty to record the death of Mr. Fred. Sibray, of the firm of Sibray and Hall, silversmiths, of St. Mary's-road. Mr. Sibray was a man of a strong individuality, hence the comparative frequency with which his name has cropped up from time to time in these Notes. In the discussion of all questions relating to the silver trade he took a prominent part. The recent controversy relating to Hall-marking and the abolition of the plate duties found him strong on the Sheffield side. He had energy enough to spare, however, for matters of more general interest, and was, perhaps, better known to the general public as the doughty champion of rights of way. More than one conflict of the kind he, at his own personal expense, carried to a successful issue. Mr. Sibray was the uncompromising foe of telephone poles and overhead wires, and he was instrumental in keeping these eyesores out of the village of Dore, where he resided. He waged a successful war against other abominations as well, and advertisement hoardings were banished from the Tatley station of the Midland Railway at his instance. Needless to say, he was a man of taste, as all silversmiths ought to be. In spite of his vehement combativeness he was a most genial fellow, and made hosts of friends. The last dread rumours came to him with fearful suddenness, he being to all appearance previously in the enjoyment of robust health. While on his way to a concert in the village of Dore he was noticed to stumble, and almost instantly expired.

THE recent children's fancy dress ball given by the Mistress Cutler, was one of the most charming functions of the season. About 200 youngsters, personating a great variety of historical characters, roamed through the noble suite of rooms in the Cutlers' Hall, and did full justice to the hospitality of Mrs. Colver. Not only was one's artistic sense gratified, but the pleasing reflection presented itself that old Sheffield families were in no danger of becoming extinct—the mass of health and high spirits animating the throng supplying direct evidence to the contrary.

THE incidence of the M'Kinley tariff is beginning to tell on the wages of one section of our working population. For a long time the spring-knife cutlers were the worst paid class of men connected with the staple trades of the town. Some years ago, however, by dint of combination they were successful in obtaining a five per cent. increase in their wages, and of this they have been in regular enjoyment up to the present. Now the principal firms engaged in the American trade, notably Joseph Rodgers and Sons and George Wolstenholme and Co., have notified their intention of reverting to the old scale. Unless this is done they say it will be impossible to do any business with the United States. If they can succeed in keeping their American connection under any circumstances it will be more than most people expected. It is to be feared, however, that they will be denied the opportunity of making the attempt, as the men have announced their intention of resisting the contemplated reduction. Although, of course, they have a perfect right to do this, it is unfortunate for all parties that they have decided to take such action in the present instance, as nothing can be more calculated to intensify the very evil they are seeking to avoid.

APROPOS of trade disputes, the term "New Unionism" is a singularly inapplicable one. Like not a few so-called new things, it is simply an old institution revived. In point of fact, the new unionism of the present day is only a milk-and-water imitation of the Sheffield Unions of twenty-five or thirty years ago. In those good old times the man who failed to pay his *natty* money was first expostulated with, then "rattened," and if he still continued obdurate, was shot "to encourage the others." It required a Royal Commission to put an end to this reign of terror. The New Unionism is open to the gravest suspicion. It attacks from behind an intrenchment of legal technicalities. If the gods would only give the New Unionists what they want, it would serve them right, although many comparatively innocent people would suffer at the same time.

TWO pieces of art workmanship, both of them football challenge shields, and each from the works of Messrs Walker and Hall, are being publicly shown in different parts of the town. One is for competition among the clubs of Sheffield and the other among the school clubs of the neighbouring borough of Rotherham. Broadly speaking, they are creditable specimens of works of their kind, although that part of each of them which gives them their distinctive character might be improved with advantage. There are plenty of art workmen in Sheffied capable of executing work of this kind, but, like Benvenuto Cellini of old, they estimate the value of their services at a tolerably high figure. This may be prohibitive in the case of the ordinary run of tea services, but it would pay in the end to spend a little more money on work of the nature of these two shields.

IT is too early to begin to speculate as to the probable state of trade during the current year. If Artemus Ward's advice, "Never prophecy unless you know," be too stringent a rule to lay down, it is at least just as well not to begin to prognosticate as to the volume of a year's trade before the month of March. The inveterate propensity of the Sheffield artizan to cease all manner of work from Christmas-eve until after New Year's Day has gradually brought about the almost universal custom in the silver trade of taking stock about the first week of the year. This, of course, interferes sadly with general work, and nobody about a manufactory has any heart for anything else until this most uninteresting process has been completed. Thus, to all enquiries just now as to the state of trade, one is met with the rejoinder, "Oh, pretty well; you see, we have just finished stock-taking, and have scarcely got into full swing yet," etc., etc.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

Messrs. Waterlow and Sons, Limited, have registered at Somerset House the Practical Electro-plating and Enamelling Company, Limited. The capital of the new Company is £2,000, in £5 shares, and its objects to acquire a business carried on at the Warwick-lane, Coventry.

Mr. F. J. Gardner presided over the first annual dinner of the English Watch Company, held at Birmingham.

Recently Mr. J. A. Wheatley lectured before the members of the Penrith Literary Society on "Gems and Precious Stones." The lecturer dwelt upon the romantic attributes of various precious stones, the talismanic legends which attached to particular gems, and the folk lore surrounding them.

On Christmas eve, the wire leading into the store of B. F. Norris, Allister & Co., Chicago, was cut almost through and the lights almost extinguished. At the same time, a man giving the name of John Hayes, was caught by a detective slipping a valuable diamond bracelet into his pocket.

Our Letter from the Diamond Fields.

(By Vaalite.)

YOU will be amused to hear that the case you reported of the Pentz diamond has proceeded a step or two further. You will remember that the stone was handed to the Attorney-General, against whom Pentz has now brought an action for recovery. The Attorney-General, however, maintains that the diamond is the property of the Crown; and notwithstanding, Mrs. Dreyer now comes forward to declare she never gave the stone to Pentz. Judgment was given for the plaintiffs, the Court directing that the stone should be kept in the custody of the detective department in order that Mrs. Mathew may bring her action against Pentz to recover the stone, which she says she only lent to him to ascertain its value. It is now said to be worth £1,700.

The most fortunate company at the present is no doubt the Koffyfontein. First of all, I might inform you that they found a very fair diamond weighing 68 carats; just previously, too, they had found a stone of 3¾, which was said to be the finest and whitest stone that had been seen for a very long time. On the same day as the 68-carat one appeared a 6-carat followed, which is said to rival the 3¾ fine stone, although the latter brought £20 a carat—a figure I don't remember ever being realised before by a gem of equal weight. In selling out, too, recently the company realised 47/6 per carat for the parcel, which is also a remarkably high price.

Turning to the river diggings, luck attended a digger, Jack Moulton, at Klipdam, near Hebron, and rewarded him with a diamond weighing 123¾ carats. It had a slight flaw or two in it, and so the owner sold for £1,237. Had the stone been sound, no doubt it would have realised at least £5,000. Nor does the luck attending this neighbourhood stop here; indeed, so great has the rush been lately that it might almost be called a "new rush." The place is about forty miles from Kimberley, and about twelve miles from Hebron. It is a large flat country, with here and there strong indications of diamonds. There is one pan called Hol-pan, where there are now a thousand white men at work, and they are finding well. I saw a fine parcel the other day which realised £2,000, and in the hands of another man I saw a number for which he was asking £12 a carat.

I am sorry to have to inform you that we have had two fatal accidents at Kimberley Mine. In the first, Charles Dodd, a European workman, only twenty-five years of age, lost his footing, and fell down a shaft to a depth that ordinarily would produce instant death. The poor fellow survived his terrible injuries more than a week, and the surgeons at the hospital of the company began to hope for his recovery. His parents, who reside in Kimberley, are prostrated with grief. A brother of the unfortunate fellow was killed in the never-to-be-forgotten disaster in the Dutoitspan Diamond Mine in 1886. The other accident was that to a contractor named Ralph Milling, who had been working in a place that had been "running" for some time in the 600-feet level, and the spot where the accident happened had what is technically known as "hung up." The unfortunate man placed three charges of dynamite behind the blue ground which caused the "choke," and fired them, and whilst he was leaving the place to get out of danger he was struck by a piece of blue ground, which fell on his head, knocking him down in a state of insensibility. While he was in this condition the charges of dynamite exploded, bringing down a large quantity of ground, beneath which deceased was buried. The natives who witnessed the catastrophe state that deceased made no movement or sound from the time he was first struck. Milling was a most careful and a very experienced miner, and it only shows some of the dangers that attend these mining operations. In the early days diamond mining consisted of nothing else but the use of the pick and shovel, picking up the ground, and shovelling it into baskets, and taking it up and spreading it out, and sorting for diamonds as they became weathered out. Now, however, the earth scratchings in many of the mines are no more, and instead of the hundreds of thousands of ropes running the baskets backwards and forwards, complete desolation exists. But at the appointed hour the men emerge from below, where they are now burrowing like ants, only much deeper, having got to over 800 feet deep in De Beers, in one of their trial shafts. The boring was commenced just outside the mine, and went slightly obliquely; they are, however, still in good yielding blue ground. I hope to send you the full account of the details of the various mines as time goes on, as there is much that has never been published in reference to them. It was thought by many that diamonds could not exist below the level of the carbonaceous shales, as they are supposed to supply the material from which the diamonds were made; but as the shales are only 300 feet thick, at least it was not the top shales that supplied it.

In spite of the severity of the law against I.D.B—ing, it is still as bad, or perhaps a little worse than ever, since the last turn of events out here. How many of the diamonds found get into the hands of these Petticoat-laners would be difficult to say. They have men always on the look out for them, and if a Kafir would not think fit, they insinuate it to him, and urge him on to do it. Recently, during a terrific storm, one broke out of the De Beers' Compound, carrying with him a monster diamond, which he sold to some I.D.B., and got off with the proceeds.

In another instance a Kafir was leaving the Compound, the officials having finished searching him, when Head Searcher Pierdon casually took up an ox-tail whisk to admire the handle, and feeling it to be unusually rigid, bent it and out fell a diamond; they then broke it, and found it, contained £750 worth of stones; and his selection showed that he knew something of the quality of stones, for they were all fine white ones.

Mr. Fred. B. Box has transferred the business of Mrs. Fletcher, 12, High-street, South Norwood, to Mr. W. Kibble.

Scientific and Otherwise.

More "Mexican Onyx."

DESPITE overwhelming statistics, were it not for the perfection of scientific instruments, which leave no room for induction or deduction, we should often be inclined to banish Messrs. Jenner, Pasteur, Koch and Company to the band of mighty dreamers. So contagious do some things appear, that nothing but a germ theory appears to be capable of explanation; yet we are left perfectly helpless to explain how so many things of the same kind lie dormant, not only for centuries, but during the whole period of civilisation, which as soon as they break out in one spot, burst forth here and there in other places most unexpectedly. In no instance is this more forcibly brought to our notice than in the case of the so-called "Algerian" and "Mexican onyx." During the whole period of Eastern civilisation, and for nearly twenty centuries of what we may perhaps be allowed to call European civilisation, only two localities were noted for the production of this lovely marble, and the second only recently. For many centuries Algeria was supposed to be its only home, although we might say that a good deal of the so-called "Algerian" in reality came from Germany. Then came the Mexican find, rivalling the original. Years went by before any other localities were discovered, but recently quite a number have been brought to light one upon the other in a most surprising manner. The recent discoveries of Pulaski County, Missouri, however, seem more extensive, perhaps, than any of the others, where onyx exists as it does in Crawford County in large veins, and as stalagmites and stalactites. There are now a number of caves known to contain this wonderful marble, one of which is at least two miles long, with a vein deposit over twenty feet thick, and of unknown extent. It is thus probable that the up-country Mexican mines will be neglected, and Missouri take first place as a producer of this lovely marble. There is one feature that must ever be borne in mind: the marble is harder than alabaster, which it resembles, and therefore takes a better polish and does not get so dirty in stock, nor is it so liable to get chipped and broken.

Discovery of Turquoise.

A RUSSIAN newspaper, the *Nowoji Wremja*, announces that a mine containing excellent turquoises has been discovered in the vicinity of Samarkand, about 200 miles N.E. of Merv. It has long been known to exist; indeed, its most celebrated locality lies around the next important chain of mountains in the adjoining country of Persia. It is certain that a great number of turquoises have lately come into the market of more than usual size; of their exact locality we are at present ignorant. We intend analysing one of them at our first opportunity. They differ somewhat from the ordinary Persian and Mexican varieties, in that instead of having a tendency towards sea-green, they are usually *dark* sky blue. Specimens of turquoises before us now, however, show the parti-colouration of both hues combined. But we must say that although we have many dozen turquoises in our collection, some of them of historic interest, we do not see this dark blue in any of them. We recently acquired a number of specimens from an old collection, most of which were from the old Persian mines, and there can be no doubt that they really go much greener. We have, nevertheless, one historic gem, presented by George II. to one of the best known beauties of his day, which is to-day as blue as one of those ideal cerulean Italian skies. At the Mineralogical Exhibition at the Crystal Palace there were exposed for sale on one of the stalls a number of "Australian gems," amongst which were some turquoises, both cut and on the matrix. We secured two or three of the latter for comparison, but the matrix, a clay slate, was so similar to that from some parts of Persia, and different from anything we know in Australia, that we shrewdly suspect it was not Australian at all, nor do we think Professor Liversedge regards it as an Australian gem.

The Panama Pearls.

AT one time the *Avicula margaritifera* of the Bay of Panama supplied many of our choicest pearls, which were always much sought after, since they were more of a blue-white than those of the *Meliagrina margaritifera* of the N.W. coast of Australia. The shells themselves showed this even as much as the pearls. With the *avicula* the outer layer is of a dark greenish blue, and the shell itself often inclines towards that colour, and even towards black, their pearls often taking the same shade. With the *meliagrina*, on the other hand, the outer layer is of a very light brown or grey, a general yellow tint frequently predominating. Unfortunately some time ago a disease broke out amongst the former, and the Government felt it necessary to put a stop to the taking of them; nor have they as yet seen their way to open the fisheries again. Recently some very good takes of shells have been made outside the bay, around the group of islands lying a little to the north-west; it thus appears probable that the industry which fell out of existence has burst out in a fresh place close by, and that we shall once more receive into the market specimens of these lovely pearls from the locality to which we have been a stranger so long.

American Bimetalism.

MANY coin collectors and observers of passing events will be aware of the fact that a model coin was made in England some years ago, the outer part of copper, with an inner circle or disc of silver. It was then shown that the centre could not be prevented from falling out in the course of wear and tear, and so the idea was abandoned. General Berdan, probably unaware of this fact, has introduced the idea into America lately as a solution of the difficulties in the currency question, but suggests no special protection against the dropping out of the centre, which we saw years ago and what must follow such an adoption. Accordingly the *Electrical Review* remarks:—"His scheme is to make a dollar of gold and silver, mechanically combined, by first making a silver coin worth 25 cents, with a hole in the centre, and then pressing into the hole a plug of gold worth 75 cents. On the face of it, this seems a good idea, as it would do away with the objection raised by all to the size and weight of the silver dollar and the minuteness of the gold dollar. In other words it is an average—a concentration of advantages.

"But the cut of the matter lies in the 'mechanically combined' detail, which is more important than at first sight would appear. It will be a delicate and difficult task to so join the gold and silver parts as to enable the coin to stand the wear and tear to which metallic legal tender is subjected.

"As usual, electricity, goddess of power and progress, can lend her aid and assist to practicability the germ of a good idea. If, instead of 'mechanically combined,' we substitute the words 'electrically welded,' the scheme becomes more practical, and the coin more beautiful and cheaper to produce. By electrically welding the gold and silver blanks together and then subjecting the composite piece to the impression of a die, a coin with slightly concave surfaces could be produced with the great advantage that the welded joint would be the strongest portion. Concaving the faces of the coin would throw the maximum wear on the outer ring of silver. Such a scheme brought to perfection would be bi-metalism with a vengeance.

"As a design for the obverse of this new coin we would suggest an ideal representation of the Goddess of Electricity. Columbia would thus be given a well-earned rest, and the coming power would be symbolized and immortalized, although such actions might offend the pretty Philadelphia girl who posed for the profile of Columbia."

Badge for Mayor's Chain at Chester.

MESSRS. B. H. JOSEPH and CO. have just turned out of their workshops a badge to be worn on the Mayor's chain for the city of Chester. The badge is oval in form, and the centre raised slightly as a medallion. The style is Elizabethan. The border consists of fifty very fine brilliants about ½ct. each, secured in beautifully carved antique settings, and surrounds a plaque emblazoned in enamel with the full armorial bearings of the city of Chester. The supporters, shield, crest, etc., are beautifully wrought and carved out of solid gold, and slightly raised above the surface of the plaque. The back of the badge is also slightly raised, and bears an inscription in blue enamel as follows:—"Presented to the city by Miss Brown, on her brother, Charles Brown, Esq., being elected Mayor of Chester for the fourth time; November, 1890." The material used throughout is 18ct. gold, and the gold is so alloyed and manipulated that no less than five distinct colours or finished surfaces are produced. The heraldic enamels are tinted and subdued to correspond with these colours, so that the great beauty of the badge consists in the manner in which the different colours (which if worked up in the ordinary style would have been incongruous) are grouped and graduated. Messrs. B. H. Joseph and Co. have been much pleased to receive a copy of the subjoined letter from the donor to their customers, Messrs. Lowe and Sons, 6, Bridge-street-row, Chester (the oldest jewellery house in the North of England).

"Messrs. Lowe and Sons, Chester.

"Dear Sirs,—I must thank you for executing the medallion so beautifully. I was very fastidious and troublesome about seeing each detail, but the result is perfection, and I am quite satisfied. My eldest brother and Mr. Sutcliffe are the same. It is exquisite; so nicely carried out, and just what I wished. Will you convey to your Birmingham correspondents my appreciation of their work, and thank them for the trouble they took in sending it in time. It will remain for ever a specimen of jeweller's work. Again thanking you—Believe me, very sincerely yours,

"Nessie Brown.

"Boughton, Dec. 26th, 1890."

Transatlantic Jottings.

The Failure of the Dueber Company.

NEVER in the history of North American trade has such a blow been received as that of one of the heaviest failures that has ever taken place by the late assignment of the Dueber Watch Case Manufacturing Company. This gigantic concern is known to our readers from the woodcut of its fine premises at Canton, Ohio, that has appeared in this journal. It was considered one of the highest of the staunch and reliable watch companies of America. Owing to Mr. Dueber's connection with the Hampden Company, the latter is also involved in the failure. The gross liabilities are said to be 612,000 dols. and the assets amount to 2,609,000 dols.; but, as most of this refers to premises, plant, and machinery, it does not guarantee that such an amount could be raised upon a forced sale. There is one part of the proceedings that strikes us as very un-English, and that is, the Board of Trade, as well as the other citizens outside of the Board, are rapidly coming to the relief of the crippled concern, and the banks of the city of Canton have pledged themselves to Dueber's assistance to an extent which leaves no room to doubt that the thing will soon again be a running concern. We wonder if such a course would be adopted in England?

The World's Fair at Chicago.

WE have already called the attention of the trade to the fact that some of the most enterprising English manfuacturers are preparing to make a great display at the forthcoming International Exhibition at Chicago. Judging from the extensive way Englishmen appear to be going about the matter, it will doubtless be the most remarkable exhibition ever held. We believe that retailers would do well to take this opportunity of making themselves known to the American public. Few are aware of the enormous amount of money spent annually in this country by Americans who represent a branch of Trade specially worth catering for and studying. No doubt some special arrangements with regard to duty and minimizing freights will be made later; meanwhile, we would direct the attention of our readers to the fact that a proclamation on the subject of the World's Fair has been issued by the President of the United States.

A Jeweller Cracksman.

ONE of the latest sensations about Saratoga, New York, is that upon the arrest of a delinquent found upon premises, on Sunday evening, December 15th, the thief turned out to be a Mr. Knickerbocker, one of the best-known jewellers, with a fine store in one of the principal streets of Ballston Spa. When searched he was fully equipped with a dark lantern, a small oil-can, wrench, keys, a vial of mysterious compound, and a revolver. For many years some clever thief has been safe-breaking in this neighbourhood, until there is hardly a safe that has not been broken open or tampered with; and, oddly enough, in most cases Knickerbocker was called in to reopen them after their maltreatment, and the skill he displayed in so doing suggested to many that he was the thief, although no evidence could be brought against him. However, he is safe enough now, and let us hope he will be prevented from trying his skill on any more safes for the natural term of his life.

How the Yankees Advertise.

A BIG watch has been running around on wheels in Washington, D.C., attached to a fine bay horse. The watch in question keeps accurate time, and crowds are attracted to it as it goes about the streets. The driver is skilfully concealed within, and to all appearances the gigantic watch seems to navigate itself. As an advertising scheme the owner and inventor, Mr. A. L. Saltzstein, jun., deserves considerable credit for so original a conception.

Some New York Fashions.

THE "Martinique Armlet" is said to be now worn by ladies in New York. It is described as being made of solid silver, "heated to pliability and then clasped round the arm of the wearer, from whom it cannot again be taken without the aid of the silversmith." We confess that we can hardly acknowledge this to be a very pleasant operation for the arm.

It is now the fashion to have one's watch movements transferred from their gold or silver case into onyx ones, on going into mourning.

Bracelets of enormous size are being worn. They are called ox chains, and in some instances we are told they are literally what they are represented, being made of iron. Usually, however, they are of silver or gold.

The Waltham Watch Company claim that their lately introduced No. 40 non-magnetic 18 size gilded hunter, or O.F., is enjoying a good run.

Still the Watch Factories rise—Shellenberg, the watch factory man, has offered to establish a watch and clock factory at Carroll, Ia., having a capital stock of 150,000dols. on condition of the donation of a site of forty or fifty acres of land and the subscription of 25,000dols. additional stock. The capacity of employing help is put down at between 400 and 500 men.

Still Greater Things are Unearthed.

A FARMER in Mahaska County, Ia., found on December 26th, a gigantic Christmas box in the shape of a solid gold nugget weighing 70 ounces on the edge of a small creek on his farm, and it is believed a heavy deposit of the precious metal will be found on investigation.

Still greater treasures are reported from Shelbyville, Indiana, of one Charles Slader, who in the early part of December took from the earth recently thrown out of a well in Jenning's Co., two diamonds weighing three carats each. It appears he put them in his pocket for a fortnight, but upon showing them to persons at Flat Rock, they immediately recognised them as diamonds. Since then it is reported that many smaller specimens have been found, as well as rubies, and that the whole country is in a state of excitement, and large numbers are now engaged in prospecting for precious stones.

The largest pearl in Chicago is now to be found in the loan office of 183, Clark-street; it weighs 164 grains.

Discovery of Sapphires in Queensland.

A REPORT has been circulated that an inexhaustible supply of sapphires have been discovered twelve miles north of Withersfield Station, Queensland, on the Central Railway. Until we get some further news and specimens we should not like to say anything about them. We fear, however, that from no mention being made of the quality they will not exceed their predecessors.

The Diamond Market.

Amsterdam.—January, of course, for the diamond trade, is always an absolutely dead month, Christmas needs being all supplied and spring ones not yet developed. But, for all that, there is some trade, and that "some" we are glad to report has been quite as good or better than that of January, 1890 or 1889, especially towards the latter end of the month, when, on the news of several American arrivals, many of the factories began a little sharper on finished goods.

Paris.—During the first fortnight of January little trade was done in lose diamonds, although trade generally was pretty brisk. Towards the latter part of the month there were decided signs of improvement, and an early season was expected.

London.—During the early part of the month there was much more rough in the hands of merchants than was offered, the bad weather having a deadening effect on the speculations of buyers, which fact was recognised by sellers, who preferred to keep their stock till brighter weather, which would no doubt bring brighter spirits. However, prices became a little easier towards the end of the month. Foreign buyers were not large, or special demands great.

The Fluctuations in the Price of Silver.

FEW would at first sight realise that American partisan politics had anything to do with the price we have to pay for silver, as we go daily to the market to get our needs supplied. Yet such is the case. A political speech may so alter the prophesies of the future, that the price of silver will be materially affected, either one way or the other. Now the "silver men" are in ascendancy: now they are offering a compromise; and the result is this unstable state of the market. One day a resolution is passed in the New York Chamber of Commerce declaring that until a uniform coinage ratio between gold and silver is established between Europe and the United States the passing of a Free Coinage Bill would result in forcing American gold coin into the market as an article of merchandise. Then comes the question of Presidentship, and to please the silver men and gain their support, speeches are made which give the market another impulse, and so up or down, as the case may be, goes the price of the metal we employ in our staple industry. It is a question if the Utopian ideal of a fixed relation between the values of gold and silver is practicable. With the history of the past to speak from, we should be inclined to think it was not. Certainly, an International decimal coinage would bestow its highest possible amount of fruit under such conditions; but this raises the question, "Which ought to come first?" Until then we can only watch, not the quotations of the day only, but the turn of events that lead to the fixing or altering of the price of silver. Many have been the changes during the past month; but during the last week there were daily small rises, and on going to press it was at 17¾d.

Whitby Jet.

It would not be the easiest matter in the world to account for the fact that very many houses of really good standing that used to keep jet, have from some cause or other abandoned it. Whether with the increase of their business they have felt above it, or whether the Anti-Mourning Society have influenced the public to pay less attention to this expression of sympathy with those who have gone before, we cannot say. But we think there is another evil to blame for this, and that was the introduction of divers sorts of materials under the name of jet, which no more possessed the characteristics of our fine Whitby jet, than they did of their still more distant relative, the diamond. Not only have we seen, and have, in fact, still before us, articles made of very inferior foreign jet and lignite, but of anthracite canal and other coals, and even carbonaceous shale. There are few gems to which our island can lay claim; but taking a gem to be a thing of beauty, comparative rarity and durability, we can boast of a true gem in the finest variety of Whitby jet. It has a perfection of blackness, coupled with the greatest amount of surface lustre and homogeneity of structure of any substance with which we are brought into contact; and when once the finest varieties are seen these facts become apparent. We have before us now several hundred specimens from all parts of the world of jets and its allies, and although we have long cherished some fine American specimens collected by our own expert friends, when we compare them with a specimen that we have lately received from Whitby, they must for ever take a back seat. In testing the qualities of these jets, too, one is more than ever impressed with the advantages that must be claimed for the Whitby specimens over those from any other part. In the majority of polished specimens of foreign jet that we have the face is more or less full of cracks, and often if one is polished out a half-a-dozen come to its funeral; not only parallel to the line of bedding, which, if the specimen is not lignitic, is always so pronounced, but in every direction at right angles to it, so that it is impossible to make articles of this material hold together for any length of time. This, no doubt, is the great evil which lies at the root of the whole question. Jewellers had this abominable rubbish palmed upon them as jet, which, no matter how quick a sale it appeared to possess, was soon represented by a draw full of breakages. And—tell it not in Gath—it was reported that this very stuff in many instances came from Whitby! Obviously, then, it was not either Whitby jet, nor had it any claim to be sold as such. However, jewellers ultimately got tired of the nuisance occasioned by it, and although the profits it bore were very large upon what was sold, somehow or other the loss upon the broken and damaged did not compensate it; and so one by one they dropped it, and the industry began to flag. It had lost the public esteem and confidence, and there seemed no hope of recovery; until, at last, it was suggested that as there was an ideal standard, and there were a number of qualities of jet ranging down to the worthless, there should be some means of guaranteeing the standard of quality in a similar manner to that employed with the noble metals. Accordingly, a meeting was called under the presidency of Mr. E. W. Beckett, M.P. for Whitby, and the principal and leading firms of the jet trade decided to adopt a system of classification of the different qualities of jet, and give a guarantee, either by a trade-mark or in some other significant and comprehensible manner, so that the public might know what they really were buying. The classifications decided upon were—

No. A1, Genuine Whitby Hard Jet.
No. 1, Foreign Hard Jet.
No. 2, Soft Jet.

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Only the A1 and No. 1 qualities will show the trade-mark. One of the chief agitators for this reform was Mr. J. Langdale, of the Standard Jet Works. His trade-mark is a double triangle enclosing the spiral shell of an ammonite, a creature allied to the nautilus of the present day, now extinct, but which, in the geological period in which these Whitby beds were deposited, were amongst the most numerous denizens of the ocean.

No. 2 Quality.—This is the common soft foreign jet usually called, "French jet." The raw material is very cheap, and being much softer the expense of working it is considerably less than that of any other jet. The colour and polish is fairly good when new, but both are soon affected by the atmosphere, and, worse still, will soon crack either by frost or heat; it is a common thing to find hundreds of cracks on one single brooch. It should only be used for small ear-rings and common brooches for cheap markets where price is the main object, but should never be used for bracelets, etc.

No. 1 Quality.—The No. 1 quality, or foreign hard jet, is much stronger than the No. 2 quality. The rough material is more costly, and the expense of working it is more, being much tougher than the No. 2 quality. It is not affected by the atmosphere, and as it will not crack it is very suitable for the medium-class goods; but does not possess the advantages of the No. A1 quality English, and is not suitable for most kinds of finest goods.

No. A1 Quality.—This is the finest English hard jet, or genuine Whitby jet. The raw material is very expensive. The advantages it possesses over all other kinds of jet are its great durability and strength. It takes a superior polish to any other kind of jet, being of a finer grain and bearing the same relation that ivory does to bone. It is much lighter in weight, and not so liable to snip. On account of its fine texture it is much more suitable for Fine Art carving, as the best of foreign jet is much coarser in the grain. It is not affected in the slightest degree by the atmosphere. It is also very superior for link and chain work, being more of the nature of whalebone. The best of foreign jet is much too brittle for this purpose. The best of foreign is also unsuitable for covering lockets on account of its being too brittle and too coarsely grained. The superiority of the finest English jet over the best of foreign jet is more clearly discerned on a polished *flat* surface. The English is as clear as a piece of plate-glass, but the best of foreign is full of waves and marks.

With so intelligible and sound basis to work upon no one need be ashamed or afraid to sell A1 Whitby Jet.

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

(Continued from page 156).

The Hexagonal System.

The Natural Forms of Tourmaline.

THERE are five gems known respectively under the names of tourmaline, rubellite, indicolite, schorl and achorite, whose differences are practically those only of colour. All, in fact, are tourmalines, and coloured variously—sometimes through a variation of the proportions of some of their chemical elements; in others, the colour is due to substances in too small quantities to be recognised. The specific name tourmaline is more generally used for all colours, prefaced, perhaps, by its colour as red tourmaline, green tourmaline, and so on. It is to the red variety that the name rubellite is applied; and to the blue, indicolite; while schorl is retained for the dark opaque and black varieties which occur in large masses; and achorite for the clear and colourless.

But although crystallising in the hexagonal system, as the two previously described species, the corundums and the beryls, the tourmaline has peculiarities of form which immediately separate it from them. In the first place, it never occurs in doubly terminated pyramids; secondly, it hardly ever occurs with a hexangular outline of the prism, so sharply and well defined as in the case of the emerald or ruby. On the other hand, the outline has always a tendency to assume a somewhat inflated triangular shape, or some multiple of it, approximating three, six, nine, and twelve-sided figures. The most distinguishing feature in their crystalline form, however, is the remarkable longitudinal striations or furrows which they put on, as shown in Fig. 19. So close do these striations follow upon each other at times, and at such various angles do the adjoining faces stand to each other, that it would be simply impossible to assign them to any systematic position, were it not for the fact that we have every gradation of form from the perfect hexagonal prism down to those possessing absolutely hundreds of faces—looking just like a beautiful acicular mineral, the needles of which are shining with almost *metalic* lustre. Occasionally crystals occur with faces sufficiently well defined for it to be seen they are six-sided, as shown in Fig. 21; or they may put on faces of a prism of the second order, as Fig. 20, giving rise to a twelve-sided prism, which may be either equally or very unequally developed. One set, perhaps, is hardly visible, in which case the crystal may represent a perfectly symmetrical hexagonal prism, with the corners just taken off; or it may approach any of those distortions, triangular or otherwise, of which we spoke at the outset. There is one feature that we may mention here, and that is, crystals of tourmalines are frequently parti-coloured, the outer part being some shade of green, and the inside rose pink, or cherry red. Sometimes the colours pass insensibly into each other, at other times they are sharp and well defined.

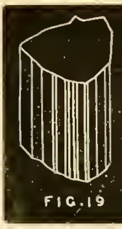


FIG. 19

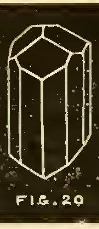


FIG. 20

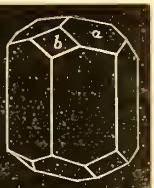


FIG. 21

Up to the present we have only spoken of the prism in connection with the tourmaline. We will now turn to its terminations. The latter are well shown in Figs. 20 and 21, but they are so diminutive that we should not be inclined to speak or think of them as pyramids, yet pyramids they are, although so low. We had occasion, in speaking of the terminations of the beryls, to call them obtuse-looking pyramids. The fact is, that their truncation makes them appear so low; if they were allowed to finish as they began, they would make respectable pyramids of a really good height. In the tourmalines, on the other hand, the pyramids are low: not because they are truncated, but because they rise at low angles. And here, again, another distinguishing feature obtains which does not occur in the beryls. It will be observed that the pyramidal planes in the figures do not follow the same vertical zone as the prismatic faces; and, secondly, it will be seen that the upper and lower pyramids or terminations are not the same in relation to the axis. It will further be observed that Fig. 20 has but half the number of faces demanded by the hexagonal symmetry. But as the planes are developed in the manner just noticed, it is not a case of true *hemihedralism*; the feature is more properly distinguished by the term of *hemimorphism*. In Fig. 21 we have a second series of pyramidal faces alternating with the first, thus making up the six faces, but it will be observed that these do not adjust matters, for in the first place they, too, are not in the same zone as the prismatic faces, and, further, they are not opposite each other. When these second faces occur with the first set, we frequently find faces of very peculiar outline, at times just cutting off their adjoining edges in the shape of the letter Y. Occasionally, also, these second planes are present in the upper pyramid and not in the lower.

We must regard all the foregoing faces together with other more complex ones, which we have not felt it absolutely necessary to describe as the possibilities of the crystal; and in looking at a group of crystals we see that with the faces developed under the most favourable conditions, some times small facets parallel to the faces *a* will occur; at others small facets parallel to *b*. These planes need not necessarily meet each other as shown in the figures; they may be separated by greater or less distances; but they nevertheless bear the same relation to those imaginary axis of which we keep speaking. It thus becomes evident how indespensable are these axis for the true *reading* of a crystal. When crystals occur isolated and free, which is only very rarely, they are usually able to develop their faces symmetrically. But generally they occur in bunches or groups where such all-sided conditions do not exist, and consequently only some of the faces are developed, whilst others are often over-developed. Upon the disintegration of the matrix by what is known as sub-aerial denudation, or under the action of rain, frost, snow, heat, etc., these crystals become detached, and sometimes more or less water-worn. It then becomes necessary to be able to "read" the crystal, not exactly from its mean outline, but to be able to see the relation which each plane present bears to the axis of the system in which the gem crystallises.

(To be continued.)

Mr. H. L. Brown, goldsmith and diamond merchant, Market-place, Sheffield, writes to caution intending buyers of jewellery against inferior pearls, mounted in low-grade qualities of gold, which, though highly coloured and burnished, possess small intrinsic value, and speedily blacken in actual wear.

When in the shop of Mr. John Ripley, working jeweller, Briggate, Leeds, Mr. Chas. Smallpage was overcome with illness, and died before he could be removed home. Mr. Smallpage, who carried on business as a jeweller at 184, North-street, Leeds, had suffered from disease of the lungs.

The Kew Report.

There are three tables in the last report for the year ending 31st October, 1890, which are of great interest to the Trade. The first gives the performance of 27 watches which gained the highest number of marks during the year; the second gives the highest records obtained by complicated watches; and the third one appeared to show the extent of verification that goes on at the Observatory, indicating that there is something beside time measurers that are the subjects of their scrutiny.

TABLE I.—RESULTS OF WATCH TRIALS.

Performance of the 27 Watches which obtained the Highest Number of Marks during the Year.

Watch deposited by	Number of watch.	Balance spring, escapement, &c.	Mean daily rate. — +Gaining. —Losing.	Mean variation of daily rate. ±	Mean change of rate for 1° F.	Difference of mean daily rate.				Difference between extreme gaining and losing rates.	Marks awarded for.			Total Marks. 0—100
						Between pendant up and dial up.	Between pendant up and pendant right.	Between pendant up and pendant left.	Between dial up and dial down.		Daily variation of rate.	Change of rate with change of position.	Temperature compensation.	
			secs.	secs.	secs.	secs.	secs.	secs.	secs.	secs.				
A. E. Fridlander, Coventry	52669	Single overcoil, d.r.,* g.b	+1·8	0·4	0·04	−1·8	+0·2	−1·8	+1·7	6·0	32·5	36·4	17·3	86·2
M. Klean and Co., London	62214	Double overcoil, s.r.,* fusee, resilient	+0·8	0·4	0·09	+0·4	−0·1	−0·6	0·0	5·5	32·8	38·8	14 3	85·9
A. E. Fridlander, Coventry	52648	Single overcoil, d.r., g.b.	−0·1	0·4	0·02	+2·2	−0·7	−0·1	+0·8	4·5	32·3	34·5	18·6	85·4
G. Carley and Co., London	47219	Double overcoil, d.r., fusee	+1·0	0·5	0·02	+2·5	+0·1	+0·3	−0·3	5·75	30 3	35 8	18·9	85·0
Jos. White and Son, Coventry	32247	Double overcoil, s.r., g.b.	+1·4	0·3	0·06	+0·7	+1·2	+1·4	+4·1	7·25	33·7	34·9	16·2	84·8
Rotherham and Sons, Coventry	80538	Single overcoil, s.r., g.b.	+1·2	0·4	0·06	+0 2	+1·5	+2·5	+0·5	5·75	32·0	36·8	15·8	84·6
Jos. White and Son, Coventry	31817	Single overcoil, d.r., g.b.	+0·4	0·4	0.07	+1·8	−0 7	−0·4	−1·5	4 0	31·8	37·2	15·5	84·5
Baume and Co., London	103018	Single overcoil, g.b.. tourbillon chronomete	−0·4	0·5	0·04	+0·2	+0·3	+0·3	+2·9	5·25	30·0	36·2	17·7	83·9
Stauffer, Son, and Co., London	120193	Single overcoil, d.r., g.b., bar-lever	+0·1	0·5	0·01	+4·0	−1·0	+0·7	−1·5	6·75	30·1	33·6	19·1	82·8
Nicole, Nielsen, and Co., London	10115	Duo-in-uno, d.r.. g.b.	−0·2	0·4	0·08	+2 1	+0·9	−1·4	−1·3	6·25	31·8	36·2	14·7	82·7
A. E. Fridlander, Coventry	52656	Single overcoil, d r., g.b.	+0·2	0·5	0·05	−1·1	−2·3	−3·5	+0·5	5·25	30·1	35·5	16·7	82·3
Usher and Cole, London	24397	Single overcoil, s.r., g.b.	+3·3	0·4	0·06	−2·4	−0·8	−4·5	−1·0	7·5	32·3	34·2	15·7	82·2
A. E. Fridlander, Coventry	52602	Single overcoil, d.r., fusee	+0·1	0·4	0·04	+0·9	+0 1	−2·8	−4·6	6·0	31·6	33·0	17·5	82·1
Stauffer, Son, and Co., London	126674	Single overcoil, d.r., g.b., bar-lever	+0·7	0·5	0 05	+0·1	−2·5	−0·5	+1·9	7·5	29·4	35·8	16·7	81·9
Usher and Cole, London	26805	Single overcoil, s r., g.b.	+2·2	0·6	0 05	−0·1	−2·0	−2·0	−1·3	5·0	28·5	36·6	16·7	81·8
Usher and Cole, London	26659	Single overcoil, s.r , g.b.	+0·4	0·5	0·04	+1·7	−1·7	+3·4	−0·3	7·25	30 2	34·2	17·3	81·7
Rotherham and Sons, Coventry	86528	Single overcoil, s.r., g.b.	−0·6	0·6	0·06	+0·1	+0·4	−0·8	−1·0	7·25	27·9	38·0	15·8	81·7
Jos. Player, Coventry	25860	Single overcoil (palladium), d.r., g.b.	+2 0	0·5	0·04	−3·8	−3·3	−5·8	+0·6	10·5	29·3	34·8	17 4	81·5
A. Vuille, Chaux-de-Fonds	10642	Single overcoil, d r., g.b.	+3·3	0·6	0·01	−1·4	+3·0	+1·1	+1·2	7·0	27·2	35·0	19·3	81·5
Usher and Cole, London	26679	Single overcoil, s.r., fusee	+0·6	0·4	0 08	−1·0	+0·9	+2·0	−1·1	7·25	31·4	35·3	14·7	81·4
H. Golay, London	1929	Double overcoil, d.r., g.b.	+1·4	0·5	0·07	−3·5	−2·6	−4·6	+0·6	9·0	30·5	35·4	15·3	81·2
S. Yeomans, Coventry	52907	Single overcoil, s.r., g.b.	+0·9	0·6	0·03	+3·3	+5·7	+3·1	−1·0	8·0	28 6	34·5	18·1	81·2
H. Golay, London	1998	Double overcoil (palladium), s.r., g.b.	+2·9	0·5	0·05	+2·8	+1·4	+5·1	−2·7	9·0	30·9	33·3	16·9	81·1
Jos. Player, Coventry	24982	Single overcoil (palladium), d.r., g.b.	−0·6	0·5	0·06	+3·1	+2·0	+1·1	−0·2	8·25	29·4	36·0	15 7	81·1
Rotherham and Sons, Coventry	84303	Single overcoil, s.r., g.b.	−2·4	0·5	0·05	−0·1	−3·3	−2·3	−1·5	6·5	29·1	35·4	16·6	81 1
B. Bonniksen, Coventry	1441	Single overcoil, s.r., g.b.	−0 6	0·5	0·03	+3·2	+0·1	−0·5	+0·8	7·5	30·1	32·9	18·0	81 0
C. J. Hill, Coventry	138154	Single overcoil, s.r., g.b.	−1·8	0·6	0·07	+1·1	−0·1	+0·8	+0 4	6·25	28·2	37·7	15·1	81·0

* d.r. double-roller; s.r., single-roller; g.b., going barrel.

TABLE II.—Highest Records obtained by Complicated Watches during the Year.

Description of watch.	Number.	Deposited by	Marks awarded for			Total marks, 0—100.
			Variation.	Position.	Temperature	
Minute and seconds chronograph, minute repeater, and perpetual calendar, with phases of the moon	2806	H. Golay, London	27·6	26·5	14·9	69·0
" " " "	2285*	S. Smith and Son, London	24·9	28·6	12·5	66·0
Minute and seconds chronograph and repeater	2839*	Baume and Co., London	29 5	34·3	14·7	78·5
" " " "	2994	H. Golay, "	29·2	33 6	15 3	78·1
" " " "	2460	S. Smith and Son "	21 7	37·7	17·7	77 1
Minute and split seconds chronograph	10115	Nicole, Nielsen, and Co., London	31·8	36 2	14·7	82 7
" " "	86965	Rotherham and Sons, Coventry	25·7	33·0	18·5	77·2
" " "	14770	S. Smith and Son, London	25·6	34 2	15·0	74·8
Minute and seconds chronograph	80538	Rotherham and Sons, Coventry	32·0	36·8	15·8	84·6
" " "	1929	H. Golay, London	30·5	35·4	15·3	81·2
" " "	1 4011	J. Hammersley, London	25 0	37 0	17·6	79·6
" " "	90405	Rotherham and Sons, Coventry	32 2	29·5	16·3	78 0
Ordinary seconds chronograph and repeater	3383	H. Golay, London	25 7	31·0	17·0	73·7
" " " "	36695	" "	27·7	28 9	15·2	71 8
" " " "	30225	S. Smith and Son, London	19·9	33 9	17·2	71·0
Repeater	52656	A. E. Fridlander, Coventry	30·1	35·5	16·7	82 3
"	36591	H. Golay, London	26 6	32·2	18·5	77 3
"	3361	" "	27 1	31·5	17 6	76·2
"	36692	" "	25 8	34 4	15·9	76·1

TABLE III.

Airmeters	5
Anemometers	14
Aneroids	62
Artificial horizons	3
Barometers, marine	134
" standard	44
" station	28
Binoculars	336
Forward	626
Forward	626
Compasses	17
Hydrometers	364
Inclinometers	1
Magnets	2
Navy telescopes	152
Rain gauges	15
Rain measures	33
Forward	1,210
Forward	1,210
Sextants	346
" shades	78
Sunshine recorders	3
Theodolites	5
Thermometers, arctic	71
Thermometers, avitreous	346
" chemical	63
Forward	2,122
Forward	2,122
Thermometers, clinical	15,536
" deep sea	40
" meteorological	4,901
" mountain	24
" solar radiation	44
" standards	100
Unifilars	3
Total	22,770

During the year 513 entries for rating of watches were made. They were sent for testing in the following classes:—For Class A, 450; Class B, 49; and Class C, 9; subsidiary trial, 5. Of these 128 failed to gain any award. Ten passed with C; 41, B; 329 with A; 34 of which obtained the *highest* Class A, *specially good.* By reference to Table 1, it will be seen that Mr. A. E. Fridlander had the honour of scoring the highest, by a keyless double-roller going barrel, which obtained 86·2 marks out of a possible 100, and another of his of the same description brought out 85·4. Altogether Coventry came out splendidly. We notice three very good results with palladium, despite what foreigners have to say against their exactness. In the complicated watches we have cause to be more than proud, when we realise the short number of years that these have been made throughout in this country. Here Coventry comes out first with Messrs. Rotherham's minute and second chronograph with 84·6. Numerically, however, they are a long way behind, Mr. Golay alone sending twice as many as Coventry, and that with very high marks. There is one thing that must strike us, and that is how many more of the higher class watches there are than the lower.

At the request of several watchmakers the Committee have slightly modified the regulations for the granting of certificates for watches which have been rated. The chief alterations are in the conditions requisite for affixing the words "*especially good*" to a Class A certificate. These are now simplified, so that all watches which have 80 marks and upwards awarded to them after trial are entitled to be characterised "*especially good.*"

Certificates were also awarded to three marine chronometers after 35 days' trial, showing their mean daily variation at three.

Equation of Time.

The Approaching Prime Meridian Conference at Rome in 1891.

AT the weekly meeting of the Balloon Society, held at St. James' Hall, Piccadilly, W., on the 2nd ult., a paper by Mr. James Kendal (of the firm of Messrs. Kendal and Dent), Vice-President, was read. The first dial (Mr. Kendal said) was apparently known about 713 B.C. as the "Sun dial of Ahaz." It was mentioned in the Bible—Isaiah, 38 chap., viii. verse. Pliny referred to one at a somewhat later period, 550 B.C., invented by Anaximander. The first dial of the sun divided into hours was seen at Rome about 293 B.C. Dials were set up in churches about A.D. 613. As far as he had been able to ascertain, the first contrivance for measuring spaces of time, independently of the motion of the earth, was introduced at Rome about 158 B.C., namely the clepsydra or water clock, invented by Scipio Nasica. It was stated that when Cæsar invaded Britain, 55 B.C., clocks were found in this country. It was reported that Pope Paul I. forwarded a clock, A.D. 760, to Pepin, King of France. Pacificus Archdeacon, a Genoese, was said to have invented a clock in the 9th century. The earliest complete clock of which there was any certain record was made by a Saracen mechanic towards the middle of the thirteenth century. King Alfred was said to have measured time by wax tapers about 887. It was believed that watches first came into use in this country about 1310, and Robert, then King of Scotland, had one. In 1477 a watch factory was established at Nuremberg, and many watches were exported to different parts of the world. Purbick, an astronomer, was said to have first employed watches for astronomical purposes about the year 1500. A watch worn by Queen Elizabeth could now be seen in the library of the Royal Institution. In 1714 the English Government offered a reward of £10,000 to any person who invented a method of determining the longitude to within a degree or sixty geographical miles; £15,000 if to within forty miles; and £20,000 if to within thirty miles. As the captain of a ship could readily ascertain the instant of noon at any place by observation of the sun, it was clear that, if he had an instrument which could be depended upon to show him Greenwich time, the calculation of the longitude would by comparison be an easy task. John Harrison, who completed the first marine chronometer in 1735, competed for the highest award, and tested his chronometer during a trip between Portsmouth and Lisbon. It was approved of by Halley, Graham, Bradley and Smith, and through their influence he got some pecuniary assistance in 1737. He was enabled to complete a second chronometer in 1739, and a third one in 1741. In 1749, a Gold Medal was awarded to him by the Royal Society for his improvements. In 1761 he completed a fourth chronometer, and submitted it to the Board of Longitude. It was tested during a series of voyages, and proved the longitude to within 18 miles (instead of the 30 miles stipulated for by the Government). Harrison received two instalments of £5,000 each; and in 1767, having fulfilled the condition so as to enable an ancestor of his (Mr. Kendal's), a watchmaker, to make a duplicate chronometer, the reward was no longer withheld, and after half a century of persevering labour, the balance £10,000 was handed over to John Harrison, who had started in life as a carpenter, at Faulby in Yorkshire.

Having dealt with dials, clocks, and watches, Mr. Kendal added that sundials mark true time, while clocks measure equal or mean time. If therefore a timekeeper, perfectly regular in its motion, were set to true or solar time, it would be found to agree with it only four times in a year. At present real and mean time agree about the 15th of April, the 14th of June, the 31st of August, and the 25th of December. The greatest differences are about the 23rd of October, when the clock is said to be 16 minutes slow of the sun, and about the 30th of January, when it is said to be 14 minutes fast of the sun. The Greenwich mean solar day, then, is really the mean of all the solar days in the year, and the equation of time is the amount to be added to or subtracted from the true solar time, in order to convert it into mean time. Sundials, of course, show true solar time. The lunar year comprehending 12 moons, or 354 days, 8 hours, 43 minutes, was the regulation of time among the Chaldeans, Persians and Jews. The solar, or astronomical year, is different, the earth performing its revolution round the sun in 365 days, 5 hours, 48 minutes, 49·7 seconds. No account was taken of the odd hours till the year 45 B.C., when the error in the computation of the year had become very considerable. The surplus 5 hours, 48 minutes, 49·7 seconds was taken as 6 hours, making one day in four years; this day was therefore added to every fourth year. There still remained the apparently trifling difference of 11 minutes, 11 seconds between the computed and the real year, this producing an error of about seven days in 900 years.

To adjust the calendar, a new one was published by Pope Gregory XIII., in 1582, omitting 10 days, the 5th of October becoming the 15th of October, which represented the accumulated error, and it was decided that three leap years should be omitted every 4,000 years, thus, as 1600 was leap year, the years 1700, 1800 and 1900 are not, but 2000 will be leap year. The new style was not adopted in Great Britain till 1752, when eleven days were jumped, the 3rd September being reckoned 14th September. As our year still exceeds the true year, although by an extremely small fraction, another leap year in addition to those should be omitted once in 4,000 years.

The daily movement of the earth (continued the lecturer) took place in 24 hours of mean time, or 86·400 seconds, and the daily rate of a chronometer would be accurately represented by this number if it went exactly to mean time, but that could never be the case, except momentarily. The timing always left a slight difference, which may be either a gain (+), or a loss (—), and we therefore have daily rate $= 86{\cdot}400 \pm$ a fraction of a second; and if we assume there be a gain of 0·2 seconds, we have, daily rate $= 86{\cdot}400 + 0{\cdot}2$ seconds, or simply $+ 0{\cdot}2$. A variation of one second a day in the rate of a chronometer would correspond in 30 days to an error of ½ a minute of longitude in time, or about 8½ miles at the equator, where the error would be of the greatest moment; such an amount of variation is generally only the result of an accumulation of daily errors. In astronomical regulators and good chronometers the difference between one day and another was not more than hundredths of a second, rapid changes were very rare, since such instruments were not subjected to sudden alterations of temperature or position when in use. An error, as a rule, was the difference between the time indicated by the chronometric, and that taken from the local regulators, so that the error varied with every change of longitude. Assuming a chronometer to be brought to Greenwich from a place whose local time was 20 minutes 3 seconds in 24 hours behind Greenwich time, we should have the error $= - 20' \, 3''$. For general purposes, to ascertain a true time, a meridian traced out with ordinary care, and tables of the equation of time would suffice, but for accurate timing, the tables published in the Nautical Almanack must be consulted. If an observatory were not accessible the time of transit of the sun or a star across the meridian must be ascertained by means of a sextant or of a mural circle firmly fixed to some immovable foundation, for it was important to be able to test the invariableness of the rate of even good regulators every eight or ten days. English chronometers submitted to the Greenwich trials were exposed during about six months to temperatures varying from Zero 0° Cnt. (32° F.) to 38° Cnt. (100° F.), the rates in different positions as referred to the meridian being recorded in order to ensure that the instruments are not subject to magnetic influence. Their order of merit was determined by a trial number, obtained by adding the difference between the greatest and least weekly rates to twice the greatest difference between one week and the next, double weight being given to this last source of error, since it was of greater importance. It would thus be seen that the best chronometers are characterised by having the least trial numbers. The Admiralty purchase such instruments as are required for the service of the Government on the result of these trials. Watchmakers could easily arrange for an oven for tests at elevated temperatures which would suffice for nearly every case.

Mr. Kendal directed attention to the deliberations of the International Geodetic Conference which met in Rome in October, 1883, on the subject of the unification of longitudes and time. The sittings of the Conference, which were attended by Col. Sir Andrew Clarke, R.E., and the Astronomer Royal, Professor W. M. Christie, as delegates of this country, lasted a week.

The resolutions proposed by the Committee were adopted by the delegates of all the States represented, with the exception of those of France. Mr. Faye, one of the French delegates, voted in favour of the adoption of Greenwich time, though he opposed the adoption of the Greenwich Meridian for longitude. The following resolution was adopted: "That the unification of longitude and of time is desirable in the interest of science, navigation, commerce, and international communication." The Congress pointed out the very inconvenient and startling anomalies as to the days of the week and month occurring in the Western Pacific and in the islands of the Indian seas. The great majority of the delegates recommended that all time should be reckoned east and west from Greenwich, noon at the Observatory being the fixed point from which time should be counted. Thus, for every place within 180 degrees east from Greenwich it was still to be Monday when it was noon on Monday at Greenwich; and, similarly, it would be the forenoon on Monday for places within 180 degrees west. A special regulation was to be made for the places lying near on either side of the Meridian.

As a specimen of the anomalies at present existing: at Sdyney, in Australia, it was two o'clock on the morning of Thursday (New Year's Day, 1891) at the moment when at Manilla it was about four minutes past midnight on the morning of Wednesday, 31st December, 1890. Or, to bring the absurdities still closer together, when it was half an hour after midnight in the morning of the last day of December, 1890, at Spanish Manilla, the New Year's morning of 1891 had just begun at Portuguese Macao, only six degrees more to the north. He believed it ought not to be impossible to harmonise these strange diversities of time. The Conference also recommended "That the Meridian and time of Greenwich should be adopted for international purposes, and the time of reckoning should be 0 to 24." An International Conference was held in 1884 at Washington, when the foregoing resolutions were adopted by all the parties who were at the Conference at Rome. At the suggestion of the Academy of Sciences of Bologna, in July, 1890 (last year), the Italian Government sent out invitations for a Second Conference at Rome, to determine an initial Meridian, in order (as stated in the circular letter) to obtain unity in the calculation of time, and, therefore, an uniform hour all over the world. The letter went further, and asked the Conference to determine Jerusalem as the Prime Meridian of the world; a place without an observatory, and, at present, only accessible from an open roadstead at Jaffa, and having no railway communication to the spot.

The Washington International Conference held eight sittings, the first on the 1st of October and the last on 1st November, 1884, for the purpose of fixing a Prime Meridian and a Universal Day. The delegates represented twenty-five different countries. The following resolutions were carried:—1st. "That it is the opinion of this Conference that it is desirable to adopt a single Prime Meridian for all nations, in place of the multiplicity of initial Meridians which now exist." This was unanimously adopted. 2nd. "That the Conference proposes to the Governments here represented the adoption of the Meridian passing through the centre of the transit instrument at the Observatory of Greenwich, as the initial Meridian of longitude." This resolution was adopted by the following votes in the affirmative:—Austria Hungary, Chili, Columbia, Costa Rica, Germany, Great Britain, Guatemala, Hawaii, Japan, Italy, Liberia, Mexico, Netherlands, Paraguay, Russia, Salvador, Spain, Sweden, Switzerland, Turkey, United States, Venezuela. Vote in the negative: San Domingo. Abstained from voting: Brazil and France. Ayes 22; noes 1; abstained 2.

The third resolution had already been read that evening, and recommended that for every place 180 degrees east of Greenwich, it should still be Monday when it was noon on Monday at Greenwich, and similarly forenoon within 180 degs. west of Greenwich. 4th. "That the Conference proposes the adoption of a Universal Day for all purposes for which it may be found convenient, and which shall not interfere with the use of local or other standard time where desirable." This was carried, with the exception of the votes of Germany and San Domingo. 5th. "That the Universal Day is to be a mean solar day, to begin for all the world at the moment of mean midnight of the initial Meridian coinciding with the beginning of the civil day and date of that Meridian, and is to be counted from 3 a.m. to 24 hours." Ayes 15; noes 3; abstained 7. 6th. "That the Conference expresses the hope that, as soon as may be practicable, the astronomical and nautical days will be arranged everywhere to begin at mean midnight."

The important results of the Conference were the establishment of:—1. A Prime Meridian for reckoning longitude. 2. A zero of time reckoning. 3. A unit-measure of time, to be common to the whole world. The Prime Meridian corresponded with the Greenwich Meridian. The zero of time might be defined as the moment of mean solar passage on the Ante-prime Meridian. The unit of the measure of time, designated the Universal Day, may be defined as the interval between two successive mean solar passages on the Ante-prime Meridian.

The Conference further determined that the hours of the Universal Day should be counted in a single series from zero to 24 (as before mentioned). The Universal Day, as defined by the Washington Conference, began and ended at the same moment as the Civil Day at Greenwich, but it differed from the Greenwich Civil Day in respect to the numbering of the hours. While the Universal Day had a single set of hours numbered from 0 to 24, the Greenwich Civil Day was divided at noon into halves, the half-days before and after noon being subdivided into separate sets of hours, each numbering from 0 to 12, and distinguished as Ante-meridian and Post-meridian. Greenwich time was the local time so called of the Meridian of Greenwich. Universal time, on the other hand, was understood to be common in all localities, and the Universal Day was held to be the date of the world. Considerable progress had been made in the adoption of the principles of universal time, and the practical success which had attended the application of these principles, went to show that the unification of reckoning by the several civilised nations could best be effected step by step. The British charts were largely used in the islands and seaports of China, and even by native Chinese. These charts were firmly established in Southern Africa, and their use was extending every day with the widening of British settlements on the eastern and western coasts of Africa. They were used by the British navy and merchant ships, in the South seas, Australia, New South Wales, Van Dieman's Land, New Zealand, and the Polynesian group of islands. The Empire of Japan had also adopted them. English was the language of the ocean, and might they not hope that Greenwich Time and the Prime Meridian of Greenwich would be adopted by all nations? The following table gave an estimate of the First or Prime Meridians which several nations used in ascertaining their longitude:—

COUNTRY.	MERIDIAN.
Great Britain and the British Colonies	Greenwich.
United States	Greenwich.
Norway	Greenwich and Christiania.
Italy	Greenwich and Naples.
Germany	Greenwich, Ferro, and Paris.
France	Paris.
Spain	Greenwich and Cadiz.
Russia	Greenwich, Pulkoro, and Ferro.
Sweden	Greenwich and Stockholm.
Holland	Greenwich.
Greece	Various.
Austria	Greenwich and Ferro.
Denmark	Greenwich and Copenhagen.
Portugal	Lisbon.
Turkey	Various.
Brazil and S. America	Greenwich and Janeiro.
Belgium	Greenwich.
Japan and Asia	Greenwich.

In the face of such overwhelming numbers it would be useless attempting to disturb the Prime Meridian of Greenwich.

At the close of the paper the following resolution was carried unanimously:—"That in the opinion of this meeting it would be unwise and inexpedient to disturb the Prime Meridian of Greenwich, as already agreed by a majority of the members of the Conferences at Rome, 1883, and Washington, 1884; and further, that Her Majesty's Government be requested to use all legitimate means in their power to prevent, at the approaching Conference at Rome, Jerusalem being fixed upon as the Prime Meridian of the world, a place without an observatory, and at present only accessible by an open roadstead at Jaffa, and no railway communication to the spot."

The Necessity of Knowing One's Business.

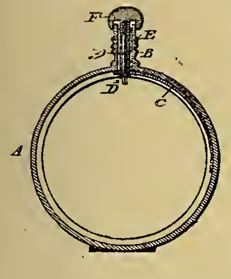
AT the Birmingham Police Court, on January 6th, a case of a somewhat peculiar character was heard, which has some points of very special importance in connection with the trade. It appears that a Mr. Francis Henry Fellows, a pawnbroker, of Deritend, was summoned for having in his possession, without lawful excuse, a watch of base metal, which had counterfeit hall-marks upon it. The watch in question having been pawned with the defendant and left unredeemed, he, in compliance with the Act, duly sent it to the auction sale on the 30th October, on which occasion a man named John Faulkner bid £5 for it. The defendant, thinking the watch worth more, bid £5 10s., and it was accordingly knocked down to him, and became his property, subject to the regulations of the Act. After getting the watch into his possession again, and before fixing a price at which he should sell it, some disparaging reference to the instrument was made in the defendant's ears; so accordingly he sent it again to the sale on November 20th, and with all the caution possible simply described it as a keyless watch, a description which, of course, no one could gainsay. Faulkner, however, recognised the watch, and once more bid for a bargain, and was no doubt delighted when it was knocked down to him for a sum considerably less than he had originally bid for it. Subsequently he found it was only metal, which led to the instigation of this peculiar prosecution. Mr. Alfred Young, instructed by Sir Thomas Martineau, appeared to prosecute, and pointed out that the whole case hinged upon whether the defendant actually knew the case was base metal when he put it up for sale on November 10th, remarking, if the magistrate (Mr. Chamberlain) thought so, it was his duty to commit the defendant for trial. Mr. Bradley, in defence, on the other hand, asked the magistrate if there was sufficient evidence to justify the course. The magistrate replying in the affirmative, Mr. Bradley asked if there was any evidence of "having possession of the watch without lawful excuse." The magistrate's clerk suggested proprietorship of the watch was shown by the fact that the defendant had put the watch into the auction, a view confirmed by the magistrate. Mr. Bradley said that under these circumstances he should reserve his defence, and answer the charge at the proper time. The defendant was then bound over in bail till the March Assizes.

FOR breaking a window and stealing seven silver watch alberts, valued at £2, the property of Mr. D. Thomas, jeweller, High-street, Birmingham, two labourers have been sentenced to one month's hard labour.

FROM the consular report we learn that during the quarter ended December the exports of fancy goods and jewellery from Birmingham were of the value of £78,609, against £92,209 for the previous year.

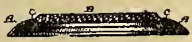
Illustrated Inventions Record.

Watch - Case Pendant.—Charles W. Hathaway, Philadelphia, Pa.



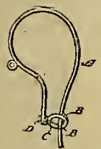
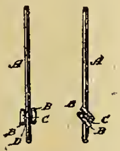
In a watch-case, an arbor having a shoulder near one end, a catch-spring directly engaging the arbor above the shoulder, a sleeve surrounding the arbor and having its lower end bearing against the outer surface of the spring, and a pendant having within it a sleeve formed with a screw-threaded opening to receive the screw-threaded end of the arbor, and against which the upper end of the sleeve has bearing.

Watch-case Bezel.—Christian Kornrumpf, Huntingburgh, Ind.



A metallic bezel, a crystal and a ring of celluloid, zylonite, or other similar material, the parts being combined and arranged to operate substantially as shown and described.

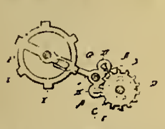
Jewellery.—Julius Bonner, New York, N.Y.

1.—A catch for bars of ear-rings, lace pins, and other articles, the catch consisting of two hooked branches joined by an incline, in combination with a swivel support.

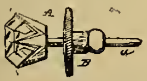
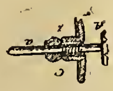
2.—A catch for bars of ear-rings, lace-pins, and other articles, the catch consisting of two oppositely-facing hooked branches joined by an incline, in combination with a swivel-support, substantially as described.

Balance-Escapement for Watches.—Archibald Bannatyne, Waterbury, Conn.



An escapement-lever constructed with an impulse-fork at one end, a banking-fork at the other end and with a laterally projecting ear upon each side between the forks, the ears formed integral with the lever, combined with two pallet-pins, made substantially wedge shape in cross-section, the ears respectively constructed with holes in shape corresponding to the wedge shape of the pins, and the pins forced into the holes in the ears, substantially as described.

Ear-ring.—William H. Whittemore and Gottlieb Müller, Newark, N. J.

The combination, with the article A, having stem a, of the follower B and the spiral spring C of less area than the said stem and adapted to clasp stem a with sufficient tension to hold the follower thereon.

Holders for Coins.—F. P. Anderson, Grosseisle, near Detroit, Michigan, U.S.A.

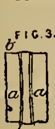


FIG. 3.

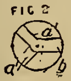
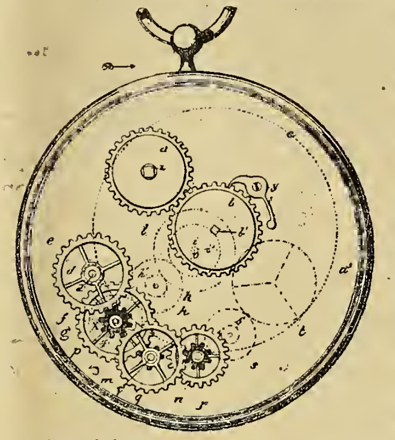


FIG 2

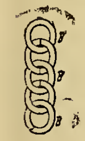
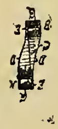
The holder is adapted to contain a roll of coins. It consists of a metal or like plate a with projecting pieces a^1 to which a strip b is pivoted. To insert a coin, b is moved on one side, the coin placed within, and b moved to its central position again.

Watch.—Auguste Amaron, Denens, Switzerland.



In a watch-movement, the combination, with the spring-barrel c, loosely mounted upon the abor b^1 and confining the main-spring, the great-wheel c', carried by said spring-barrel, the pinion b, mounted on the barrel-arbor, and the pinion a, mounted on the winding-shaft Z and gearing with the pinion b, of gearing for communicating motion to the minute and hour hands from the barrel, consisting of the pinion d, mounted on the arbor h and gearing wit the wheel c', the wheel e on said arbor d, the pinion f on arbor f' and gearing with wheel e, the pinion g on said arbor f', the pinion h on arbor h', gearing with said pinion g, the centre pinion i on arbor i', with which gears the pinion h, the pinion l, loosely mounted on arbor i' and gearing with pinion k on arbor h', and having a sleeve l, loosely fitting over the arbor i', and the minute and hour hands i^2 l^2, respectively mounted on the arbor i' and barrel l, substantially as and for the purpose specified.

Ornamental Chain.—Leonard S. Beals and Philip Thomas, Long Island City, N.Y.

A chain-link composed of two or more divisions provided with plane surfaces along which they are united to form the link, a thin edge split to enable the divisions of alternate links to be interlocked with each other, a thick edge formed on the divisions and provided with hollow spaces, such spaces being covered by the thin edges.

Pen and pencil holders. W. Brierley, Central Chambers, Halifax, Yorkshire.

Gravity holder, the carrier having a pen at one end, and pencil at the other. Within the outer case a is fixed a tube b, slotted at f and g, which encloses a second tube d, slotted at h, the latter sliding, but its movement being limited by a pin i working in the inclined slot g of the tube b. The tube d is normally held projected by the action of the spring k. The carrier (Fig. 6) slides within the tube d, but its movement is regulated by a pin e, which passes into both the slots f and h. If the end of the tube d be now pressed in, it is turned by the action of the pin i and slot g, and the two slots g, h coincide, allowing the carrier to fall down, projecting the pen. On releasing d the spring forces it again, and locks l in the cross-slot at the bottom. On inverting the holder and pressing in d the carrier is released and falls within, and on pressing a second time, the pencil is projected at the lower end.

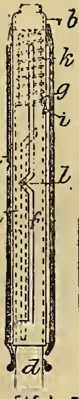


FIG. 1.

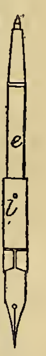
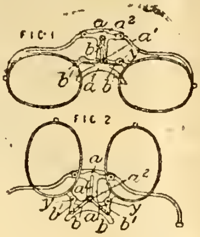


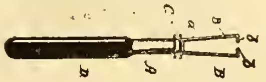
FIG 6

Spectacles.—D. McKellar, 28, Ladbrooke-grove-road, North Kensington.

Relates to a means for enabling the wearer to push the glasses out of the line of sight when not wishing to use them, without removing the frame from his head. The lenses are mounted in frames carried by arms b^1, b^1 pivoted at y, y to the bridge a, and to arms b, b centred on a pin a^2. The pin slides in a slot a^1 in the bridge, and when the glasses are not required they are pushed up, assuming the position shown in Fig. 2, where they are held by a catch.



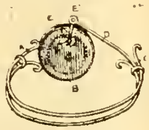
Seconds-Hand Tool for Watch-Makers.—Augustus Schwerter, New York, N. Y.



Watch-makers tool, formed from a metal tube and having the spring-arms B B, the jaws $b\,b$, having the recesses b' therein, and the sliding ring.

Watch-Bracelet.—Tom G. Hull, London.

1. The combination, with a bracelet, of a watch attached to the same, one end or shoulder of the bracelet being connected with the winding mechanism of the watch, substantially as set forth.



Gazette.

Bankruptcy Proceedings.

Bartle, George, Scunthorpe, watchmaker. Receiving Order and Adjudication.

Medlen, Montague, late trading as M. and C. Medlen, late 246, Kentish Town-road, now 144, Herbert-road, Plumstead, jeweller. Adjudication.

Pearce, James, 23, Whitefriar-gate, Hull, jeweller. Receiving Order and Adjudication.

Williams, John Hood, High-street, Haverfordwest, watchmaker and jeweller.—*Creditors :—*

		£	s.	d.
Feldman, M.	Birmingham	23	19	0
Sloane and Carter	,,	115	0	0

Deeds of Arrangement.

Mears, Alonzo, 73 and 75, High-street, Camden Town, watchmaker and jeweller. Trustees: Charles Y. Dean, Goldsmith's-buildings, Charterhouse-street, manufacturing jeweller, and ano. Filed December 6; unsecured liabilities, £3,847 9s. 1d.; assets, £5,000.—*Creditors: :—*

		£	s.	d.
Williamson, H.	London	897	0	0
Lewis, W.	,,	747	0	0
Bullers, Hutchinson and Co.	,,	517	0	0
Dreyfus and Co.	,,	496	0	0
Werthein and Hirsethorn	,,	218	0	0
Rolez, J.	,,	141	0	0
Levy and Co.	,,	68	0	0
Miller Bros.	,,	15	0	0
White, A.	,,	14	0	0
Tyrrell, H. and Son	,,	50	0	0
Mears, Alonzo (Exors. of)	,,	525	0	0
Barker Bros.	Birmingham	30	0	0
Hayes Bros.	,,	23	0	0
Rent, Rates and Taxes		82	0	0

Cross, H. J. and Co. (Henry John Cross, lately trading as), 9, High-street, and 44 and 51, Longbrook-street, Exeter, watchmaker and jeweller. Trustee: John Dow, 91, Farringdon-road, London, E.C., director of, with a committee of inspection. Filed December 18; unsecured liabilities, £3,113 15s. 4d.; assets, £1,949 19s. 3d.—*Creditors :—*

		£	s.	d.
Murdock, J. G. and Co.	London	2,075	0	0
Dunier Bros.	,,	121	0	0
Wolf, M. M.	,,	26	0	0
Mayer and Faulda	,,	125	0	0
Cooper and Co., Limited	,,	224	0	0
Huguinen and Hall	,,	26	0	0
Carlhian and Beaumetz	,,	116	0	0
Harris and Son	Birmingham	17	0	0
Blanckensse and Son	,,	15	0	0
*Wilts and Dorset Bank	Exeter	171	0	0
Tounseut, James	,,	15	0	0
Ottau, Walter	,,	14	0	0
Cross, Mrs.	,,	38	0	0
Cole, R. C.	,,	20	0	0

Kitley, Edward, 23, New Bond-street and 5, Princes-buildings, Bath, jeweller. Trustee: Walter Edward Mullins, 5, Margaret's-buildings, Bath, accountant. Composition of 13s. 4d. in the £, payable at two and four months from date hereof, secured by assignment to trustee. Filed December 20; unsecured liabilities, £334 19s. 10d.; assets, £547 11s. 8d.—*Creditors :—*

		£	s.	d.
King and Son	London	11	7	6
Carthoux and Beamley	,,	14	3	0
Cooper, —	,,	17	10	0
Raves, —	,,	11	0	10
Lewis, —	Bath	12	0	0
Sloane and Carter	Birmingham	75	12	7
Harper, —	,,	13	13	9
Silveston and Co.	,,	11	0	0
Reynolds, —	,,	23	12	2
Lock, —	,,	19	10	0
Lyon, —	,,	14	10	0
Unna, —	,,	18	5	1
White and Son	Coventry	14	14	0

Powell, Samuel James, 6, Winchcomb-street, Cheltenham, watchmaker and jeweller. Trustee: George G. Poppleton, 26, Corporation-street, Birmingham, C.A. Filed January 21, 1891; unsecured liabilities, £569 3s. 8d.; estimated net assets, £500.—*Creditors :—*

		£	s.	d.
Barnett, B.	Birmingham	19	14	4
Collett and Co.	,,	213	6	3
Harris and Sheldon	,,	14	3	4
Margrett, H. G.	Cheltenham	50	0	0
Powell, Samuel Dixon	,,	50	0	0
Raphael, J., and Co.	London	16	11	3
Unna, J. A.	Birmingham	27	0	11
Williamson, H.	London	27	5	2

Hunt and Sanderson, 36, Goose-gate, Nottingham, 9, Drury-hill, and 36, Wilford-road, Nottingham, clothiers and jewellers. Partners: Arthur Hunt and William Henry Sanderson; Trustee: Robert Rhodes, Nottingham, C.A. Filed December 24, 1890, by order on terms; unsecured liabilities, £839 4s. 10d.; assets, £555 14s. 5d. Partners' separate estates: William Henry Sanderson, 9, Corporation-road, Nottingham; unsecured liabilities, nil; assets, nil. Arthur Hunt, 21, Notintone-place, Sneinton, Nottingham; secured creditors, £45; unsecured liabilities, £203 16s. 7d.

Jones and Price (Samuel John Jones and Theophilus Price), stampers and piercers, 7, 8 and 9, St. George's-place, Birmingham.—*Joint Creditors :—*

		£	s.	d.
Stubbs and Co., Limited	London	102	0	0
Bassett, Bagnall and Co.	Birmingham	1,038	0	0
Berndorf Metal Co.	,,	21	0	0
Birmingham and Midland Bank	,,	1,446	0	0
Cartwright, R. (rent)	,,	18	0	0
Gas, water and rates	,,	25	0	0
Ratcliffe, J. F.	,,	156	0	0
Wilkinson, J., and Sons	,,	71	0	0

Barrett, Arthur, optician and watchmaker, 23, Russell-street, Landport. A private meeting of creditors was held herein on the 6th ult., when an offer of 5s. in the £, within three months, secured, was made on behalf of debtor and accepted. Unsecured liabilities, £461 2s. 7d.—*Creditors:*—

		£	s.	d.
Burnstein, —	London	17	10	0
Dimier Bros.	,,	54	0	0
Horwitz and Co.	,,	13	3	9
Pratt and Son	,,	12	3	2
Simpson, —	,,	70	0	0
Ahronsberg, —	Birmingham	18	0	0
Harper, —	,,	39	18	7
Willis, — (Successor to)	,,	24	0	0
Barrett, E.	Landport	124	11	0
Hollanders, —	Southsea	16	11	0

Sequestration.

Hunter, William, watchmaker and jeweller, 88, Murrygate, Dundee. Liabilities, £544 13s. 8d.; assets, £232; preferable claims, £29.—*Creditors:*—

		£	s.	d.
Harburg, Henry and Co.	London	54	19	11
Banen, E. F.	Birmingham	22	15	0
Griffith, William	,,	53	1	1
Harris, Henry and Co.	,,	35	9	3
Sydenham, A.	,,	22	1	11
Hunter, James	Chester	69	0	0
Blackwood, Henry	Dundee	67	15	0
Macdougald, G. D.	,,	26	0	0
*Town and County Bank, Ltd.	,,	25	0	0
Hunter, John S.	Kirkcaldy	24	0	0
Pender, James and Co.	Sheffield	16	16	2
Sundry creditors under £10	...	50	0	0

Bills of Sale.

Clarke, Henry John (trading as Stacy, Marks and Company) 9, Trinity-hill, Margate, jeweller, in favour of Frederick Clarke. Filed January 12; £95.

Evans, Ebenezer, Llwynygwew, Clwydyfagwr, Merthyr Tydvil, watchmaker, in favour of Horace W. Evans. Filed December 27, 1890; £73 9s. 6d.

Fitt, Charles Robert, The Village, Old Charlton, and 5, Langton-terrace, watchmaker, and jeweller, in favour of Mary A. Fitt (his wife), Blackheath. Filed January 13; £244 of property at 5, Langton-terrace aforesaid.

Fitt, Charles Robert, The Village, Old Charlton, and 5, Langton-terrace, watchmaker and jeweller, in favour of Edward G. Lawrence, Blackheath. Filed January 13; £165 of property at The Village, Old Charlton.

Gant, Daniel Maurice, 5, Chapel-street, Vere-street, Oxford-street, dealer in jewellery (of property warehoused at Messrs. Lomath Bros'. Depository, Bentinck-street, Vauxhall-bridge-road), in favour of London and Westminster Loan Co. Filed January 16.; £60.

Dissolutions of Partnership.

Krzeczkowski and Ludgate, and the **British and Foreign Watch and Clock Repairing Co.**, 63, St. John's-gate, Clerkenwell, watch and clock makers, dealers in watches, clocks, and watch materials. Dec. 15.

Platnauer Bros., Rue des Arts, Chaux de Fonds, Switzerland, 10, Victoria-street, Bristol, and Ludgate-hill, Birmingham, watch and clock manufacturers, jewellers, and merchants. Dec. 31, 1890. As regards George Platnauer.

Patterson and Slater, 189, Warstone-lane, Birmingham, manufacturing jewellers. By effluxion of time.

Notices to Creditors.

Geddes, William, 20, Great Marlborough-street, Regent-street, diamond merchant. Application for debtor's discharge, High Court of Justice in Bankruptcy, February 13, at 11.

Hoddell, Cope, trading as **James Hoddell and Co.**, 4, Oxford-terrace, St. Mary-church, Torquay, and Chapel-fields, Coventry, watch manufacturer. Second and final dividend of 2s. 3¾d. (7s. 3¾d. on new proofs) at Official Receiver's, Coventry.

Lury, Maurice, 32, Great Clowes-street, Lower Broughton, Manchester, wholesale jeweller and importer of foreign fancy goods. Application for debtor's discharge, Court-house, Quay-street, Manchester, February 25, at 10.

Myers, Joseph, 14 (formerly known as 5), Duke-street, Aldgate, and 13, Salisbury-road, Dalston, wholesale optician and jeweller. Application for debtor's discharge, High Court of Justice in Bankruptcy, February 13, at 11.

Smith, George Tuxford, Boston, watchmaker and silversmith. Trustee, Official Receiver, Lincoln; released.

Urwin, George Taylor, Whitby, 17, Grove-street, and Corney's-yard, Baxtergate, jet ornament manufacturer. Trustee: Official Receiver, Middlesborough—released Nov. 8, 1890.

Wadsworth, John, Turner's-hill, Cheshunt, watch and clock maker, jeweller, and fire insurance agent. First and final dividend of 6s. 2d. at Official Receiver's, 95, Temple-chambers, Temple-avenue, E.C.

Williams, Thomas Frederick (trading as F. Williams and Co.), 1, West-street, Prescot, watch material dealer. Proofs for intended dividend. Trustee, Official Receiver, Liverpool.

Williams, Thomas Frederick (trading as F. Williams and Co.), 1, West-street, Prescot, watch material dealer. Bankrupt discharged, subject to the following conditions, namely:—That he pay or transfer to the Official Receiver, trustee of the property of the bankrupt, the whole of his future earnings, income, and after-acquired property, after retaining the sum of £150 per annum, as an allowance for his maintenance, until, with the dividends payable out of the estate, the total dividends paid to the creditors shall amount to 10s. in the £. December 19, 1890.

Public Examinations.

The public examination in bankruptcy of Isidor Braun, dealer in pearls and diamonds, at 14, Hatton Garden, was conducted in the London Court of Bankruptcy, on January 14th. The debtors amended statement of affairs showed liabilities to the amount of £22,190, of which £10,243 are fully secured, and £10,505 expected to rank, with assets estimated at £7,236. Mr. Mann appeared for the bankrupt, and the trustee (Mr. Rabbidge) attended in person. Upon examination by Mr. Grey (assistant receiver), the bankrupt stated that he commenced business about thirteen years ago without capital. He started as a broker, and it was not until about eight years ago that he began to deal in precious stones. Capital was necessary for the business, but he bought goods on credit. He pledged stock with pawnbrokers in order to be enable him to meet his liabilities. During the last three years he had purchased goods to the amount of about £14,000, and had obtained advances on them to the extent of about £10,000. He estimated that the proportion of goods pawned, which he had not paid for, was under £4,000. Speaking approximately, he thought that about two-thirds of the goods had been paid for at the time he pawned them. He had pawned goods which had been supplied to him on approbation. He had purchased goods after he had pawned them, and did not acquaint the parties from whom he had them of the manner in which he had dealt with them. His business had brought him in more than sufficient to cover his expenses. In 1876 he effected a private arrangement with his creditors, and paid them a composition of 5s. in the pound on debts of about £700. It was on September 24th last, that a bill was first returned to him, but in the previous June he had to renew, to the extent of £120, a bill for £240. In reply to Mr. Mann, the bankrupt said that with one or two exceptions, the goods were in his hands on commission, and he had an authority to sell them. Mr. Registrar Giffard: But did he have authority to pledge them? Mr. Mann: That is a debatable question. The bankrupt further stated that he had recourse to pledging, in order to increase his turnover. He had paid for the greater part of the goods by giving bills, which the creditors accepted as cash. Some further particulars being required by the assistant receiver respecting the pledging transactions, his Honour directed a short adjournment.

In the London Bankruptcy Court, W. G. Imperiali, formerly assistant to a jeweller in Bond-street, appeared to pass his public examination. The Bankrupt stated that he had been a jeweller's assistant for some years, during which time he had also dealt on his own account. He had on several occasions pawned goods sold to him on credit. With reference to a debt to Mr. Brooks for jewellery, he sent some of the jewels to a friend, who lent him money upon them. That was two days after he purchased the jewellery. The Registrar: Who was the friend—a pawnbroker? Bankrupt: Yes (a laugh). The Registrar: Then why not say so? It seems to me that a large number of the cases which come to this court ought to go further east (a laugh). The Bankrupt stated that he had been to Buenos Ayres for the benefit of his health; he did not go there in order to avoid criminal proceedings. He had anticipated receiving £2,000 from his father's estate. The case was adjourned to enable the bankrupt to file further accounts.

Harris D. Brenhote, jewellers' factor, Summer-hill-terrace, appeared in the Birmingham Bankruptcy Court for public examination. The bankrupt stated that his debts were £5,012 and the assets £2,098. He commenced business in Liverpool in 1862 and failed in 1865 and 1879. He emphatically denied the suggestion that he had ever been in prison for fraud. The examination was concluded.

The public examination of Wm. Henry Buckley Gardner, watch manufacturer, took place at Coventry. The bankrupt did not admit that he was now insolvent if his effects were sold properly. Apart from his liability to Lloyd's Bank, which he thought was fully covered by house security, his trade debts only amounted to £54. The examination was closed.

Meetings of Creditors.

A meeting of the creditors was held of the late C.M. Turner, of 277. Hagley-road, Birmingham, and who formerly carried on the business of a gold and silver jeweller at 26, Regent's-place. Turner had committed suicide at the Hôtel Bertrand, Paris. Prior to this act of self-destruction he executed a deed of assignment, under which Mr. J. Rhodes, of Newhall-street, was appointed trustee of the estate. At the meeting of creditors (Mr. Wedgewood presiding) it was agreed to accept the deed, and a committee of inspection was appointed to help the trustee to realise the assets. It is hoped that something like 15s. in the pound will be forthcoming. The liabilities are put at £1,858 8s.8d., and the available assets (consisting of stock-in-trade and furniture) are estimated at £1,686 14s. 3d., the deficiency being £171 14s. 5d.

Applications for Discharge.

Sir R. Harington, Bart., heard an application in the Coventry Bankruptcy Court for the discharge of Cope Hoddell, watchmaker, Coventry and Torquay. The Official Receiver reported that the debtor had continued to trade after becoming aware that he was insolvent, and the judge suspended the discharge for three months.

An application was heard at Truro for the discharge of David Christopher Ingram, formerly a working jeweller at Penzance. The Official Receiver reported that the debtor had not been guilty of any misdemeanor. The judge observed that the bankrupt had been trading on paper and not on capital at all. The discharge was granted, subject to suspension of four months.

Jas. G. Needham, who formerly carried on business in West-street, Sheffield, applied to Judge Ellison for his discharge in bankruptcy. The liabilities amounted to £223 11s. 6d., and the assets to £125 19s. 4d. The discharge was granted, subject to one month's suspension.

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At Preston, Robert Scanlan, jeweller, was remanded on the charge of uttering a forged hall-mark on chains bearing an imitation of the Birmingham Assay Office.

During 1890, in the jewellery and fancy trades, there were registered 123 bankruptcies against 135 in the preceding year, 116 deeds of arrangement against 140, and 316 bills of sale against 317 in 1889.

Death has been exceedingly busy in the trade during the month of January. Mr. William Butler, who for thirty years carried on business as a watchmaker and jeweller at St. Helens, died on the 20th ult. Mr. Frederick Sibray, principal partner in the firm of Messrs. Sibray, Hall and Co., silversmiths, Sheffield, also expired whilst getting ready to attend a masonic concert. Mr. Frank Moult, another well-known silversmith, of Sheffield, succumbed to an attack of heart disease whilst skating, his death being equally sudden.

ANSWERS TO CORRESPONDENTS.

We have lately received a number of letters, of which the following may be taken as a sample:—

"May I venture to congratulate you on the improved style and tone of the Watchmaker, Jeweller and Silversmith in the last few issues. I am pleased to note this improvement, as the paper gives evidence of your intention to keep it at the head of the Trade Journals, a position which it now thoroughly deserves. The various new features are full of interest, and are likely to be well taken up by the trade. . . . ." "A Subscriber in Brisbane," of the highest standing, says, "I also take the opportunity of recording the extreme pleasure it gives me to subscribe to your paper. I subscribe to many other papers, but I always look forward to the receipt of the Watchmaker, Jeweller and Silversmith with interest that cannot be extended to the others. I should like to see you take up the subject of 'Practical Optics'; it would undoubtedly produce a beneficial effect upon business, as it would induce amateurs or experimentalists to take up the making of instruments, and consequently, directly or indirectly, call for the aid of the optician." We may say in reference to this last subject that we intend publishing such a series of articles as soon as we possibly can.

C. H., Shrewsbury, asks: "Is it possible to measure the height of the cathedral spire by the sun? If so, is it necessary to know the time of day, or day of the year?"—This can be easily accomplished, irrespective of the sun's altitude, although it is best done during the middle quarter of the day, and that without knowing the day of the year, either, by plane trigonometry, or much more simply in the following manner:—Let your stick stand *aplomb*, whose height is, say, thirty inches; now measure the length of the shadow cast by it, which we will imagine to be twenty inches. Now form the centre of the base of the spire, or the point vertically below the highest portion, measure the length of the shadow cast upon the ground, and it will be found to be twenty-thirtieths, or two-thirds the length of the height of the spire.

Turret observes: "Nearly all the tower clocks look about the same size, except when one meets with a smaller clock, which then immediately strikes one as being objectionable. Is there any rule by which this is managed, so as to get this uniform appearance?"—Yes; the rule usually adopted, and one which complements the laws of perspective, is to increase the size of the dial one foot for every ten feet the clock is elevated. Thus, in a ninety-feet tower a dial would be made nine feet; in a hundred ten. This height is seldom exceeded.

"Adamas" asks who is right? One authority says, Herr Voulsanger cut the Koh-i-noor, and another that Mr. Coster, of Amsterdam, cut it; whilst a third says it was cut in the Haymarket, London, by Messrs. Garrod? Just which you please. The cutting was entrusted to Messrs. Garrod, who engaged with Mr. Coster, of Amsterdam, to have a room in the Haymarket fitted up for cutting the precious jewel; while Mr. Coster placed it in the hands of one of his most competent workmen, Herr Voulsanger.

"Leap Years."—1900 will not be a leap year. The "New Style" was introduced by Pope Gregory XIII. to rectify the errors you speak of, in which ten days were omitted, the 5th of October, 1582, becoming the 15th. It was not adopted in Britain till 1752, by which time the error had augmented to 11 days, so that the 3rd of September was reckoned as the 14th. Italy, France, Spain, Portugal, Denmark, Holland, and Flanders adopted it in 1582; Switzerland partially in the following year, and Germany in the next; and Hungary three years later. In Russia, Greece, and throughout the East the old style is still retained.

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The Watchmaker, Jeweller and Silversmith.

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Cleared in Three Days!

WE are sorry to have disappointed numerous friends who wanted the WATCHMAKER, JEWELLER AND SILVERSMITH last month, and were unable to obtain copies through the journal running so rapidly "out of print." Although, forewarned to some extent by the steadily increasing demand, we printed a larger edition of the February number than in any previous month, the whole issue was completely exhausted in three days from the date of publication; and many were the applicants who went empty away from the publishing office. The rush took us a little by surprise; and though we do not intend to be left behind again in this way, we are bound to say that no more gratifying evidence could have been given that our efforts to make the WATCHMAKER, JEWELLER AND SILVERSMITH a thoroughly "live" paper are appreciated by the trade.

An "English" Watch.

PROBABLY no case taken up by the Watchmakers' Trade Association has features of more importance in it than the one recently brought before Mr. Horace Smith at the Clerkenwell Police Court. In this case Messrs. James Gent and Phillip Bettle (trading under the style of Geo. Carley and Co., at 30, Ely-place, London), were charged under the Merchandise Marks Act with having in their possession for sale a watch purporting to be of British make, but the material parts of which were admitted and shown to be of foreign manufacture. The history of this particular kind of movement can perhaps be best obtained from the evidence put in by the Association. Mr. Thomas B. Hewitt, managing director of the Lancashire Watch Company, said he started making English movements in 1870 of this pattern, which were subsequently copied by Raymond Brothers in inferior quality. The inferior quality of these movements was also affirmed by Mr. Samuel Yeomans, of Coventry, and several other qualified witnesses. They are well known in the Trade as Raymond movements, and are stamped R.B. Their exact *legality*, however, may be best judged from the fact that since the passing of the above Act, Messrs. Raymond have been obliged to retire from the trade. It appears the defendants sent this particular movement to Richard Gore, a watch finisher, of 90, St. John-street-road, who immediately recognised it as a Raymond Brothers' movement, and noticing the R.B. had been effaced, and that it bore the name of "Campbell and Co., Smithfield, Belfast," he very laudably communicated with the Association.

Mr. Forrest Fulton, prosecuting on behalf of the Society, pointed out that this was not a case of a "forged trademark," but of a "false trade description," and, in order to avoid the penalties under the Act, it was incumbent upon the defendants to prove that they had taken all reasonable precautions; that they had no reason to suspect the genuineness of the description; and that, on demand made, they gave all the information in their power with respect to the persons from whom they bought the goods—in other words, that they acted innocently throughout. A "trade description" was defined to be "any description, statement, or other indication, direct or indirect, as to the place or country in which any goods were made or produced"; and "a false trade description" was declared to mean "a trade description which is false in a material respect as regards the goods to which it is applied, and includes every alteration of description, whether as to addition, effacement, or otherwise." The presence of the name of "Campbell and Co., Smithfield, Belfast," was a rather serious point in this case, and he proposed to call a member of that firm who would swear that they never had had any dealings with Messrs. Carley and Co., and that their name had been placed upon the watch without their knowledge or authority. The importance of this point lay in the fact that by placing on the watch the name of a firm of watchmakers carrying on business in a remote part of the United Kingdom the defendants might have rendered the fixing of responsibility extremely difficult.

The defence procured an array of the best counsel of the day, conducted by Mr. Asquith, Q.C. There was no attempt, in the face of the evidence, to deny the movement was a Raymond, it being affirmed that the "R B" had been effaced by accident, a thing which, of course, might have happened, but, if so, was an unfortunate coincidence. Then Mr. Gent was called, who gave an entirely different opinion as to the inferiority and cost of the Raymond movement, stating the difference between it and the Lancashire movement was very slight, and also that the materials out of which the movements were made were of English manufacture. He explained the appearance of the name of "Campbell and Co." upon the watch as arising from the fact that that firm had given them a conditional order that if they obtained a Kew certificate for a watch they would purchase it. It is a great pity they did not subpœna the firm to prove this, but on the contrary, Mr. Fulton inadvertently remarked "they also said something about taking proceedings on their own account." But, even admitting that the order was given, the question that naturally arises is, whether it is lawful to stamp the name of "Belfast" upon a watch made in London. We know this latter is an open question in the mind of some, although the term "a trade description" is defined as any "indication direct or indirect as to the place in which the goods were made or produced." It is from the literal reading of this that several conscientious Birmingham houses have refused large orders for goods bearing the London Hall-mark, or the initials of the customers resident out of their town. We can but admire the skill with which the learned counsel made the defence, but despite it all Mr. Horace Smith was of the opinion that there had been a false trade description in this case. The watch was described as a watch made in England. The meaning of that was that it was substantially made in England, and he was of opinion that this watch was not substantially made in England. He fined the defendants £10 and £5 costs, and declared the watch to be forfeited under the statute. This final decision was received with loud applause in a court that had throughout the hearing been crowded with persons connected with the watchmaking trade. At the same time, we hope Messrs. Campbell will take some decisive steps in the matter, and show their real position in the case. If they gave such a conditional order, it is only right in justice to the defendants to admit it. But if on the other hand they did not, the case is one of "christening," which ought to be treated with all the severity it deserves.

The Markets.

THE DIAMOND MARKET.

The month began well in London, Amsterdam, and Paris. Good large Russian orders came in, and numerous other foreign buyers were in the market, both from the United States and South America. Rough and cleavages were in demand, and although prices in London were perhaps a trifle easier, a large quantity of stuff was turned over. This naturally stimulated the factories a good deal, and many were running again that have been idle. During the succeeding part of the month the turnover was quite satisfactory, many having been extremely busy. On the whole perhaps the prices increased a little.

SILVER.

After improving at the commencement of the month to 47d., it again dropped to 44¾d. on the 17th, but improved to 45$\frac{1}{16}$d. on the 19th; it then remained firm, and on going to press is 44¾d. It will thus be seen that the vicissitudes of the American Silver Bill materially influence the market, and are greatly, if not wholly, responsible for the battledore and shuttlecock return that we have been hampered with for the last eighteen months. But at the same time, be the action of America what it may, the little cloud that rose in the South, in the Broken Hill Proprietary, will assuredly spread over the whole horizon. With so large an output as that last reported, markets must be kept down, unless there arise an Australian Cecil Rhodes.

PLATINUM.

Platinum is still on the rise, and from Russian advices is likely to advance further, as the whole of the platinum which will be produced in the Ural mines for the next ten years has been sold to some foreign speculators. As the direct result of this contract platinum has risen from 2,500 to 12,500 roubles per pood, or from £375 to £1,875 per 36lbs. The great advance is stated to be largely due to the increased use of the metal in electrical work, and, indirectly, photographers have contributed their mite towards the demand. The value of platinum stills and dishes is now fabulous; and it is worth any student's while who has got any platinum foil or wire to realise. This rise will, of course, affect the price of dental alloy, and such cases will soon fetch as much as gold.

IVORY.

The first ivory sales of the year, in London, have been marked by a slight relaxation in the exceptionally high prices which ruled during the greater part of last year. The ivory brought to the hammer was rather over 125 tons, of which 23 tons were withdrawn, principally Egyptian. The average decline was about 10 per cent. on current rates, nearly all varieties being easier, except walrus and wild boars' tusks, which fetched more money. As a result of the sale, ivory cutters have slightly lowered their prices for ivory handles to the trade. It still remains to be seen whether there is anything in the talk of extinction of the mighty tusker, a question upon which there is a divided opinion, even in the best-informed circles.

BOARD OF TRADE RETURNS.

The clocks and parts thereof imported during January reached the value of £36,205, against £30,489 in the same month of last year, and £27,250 in that of 1889, as follows:—From France £12,037 as compared with £12,627 in January of 1890, and £9,701 in 1889. From the United States £6,975 as compared with £5,925 in January of 1890, and £6,235 in 1889. From other countries £17,193 as compared with £11,937 in January of 1890, and £11,314 in 1889.

The watches and parts thereof imported last month valued £25,151, in comparison with £37,885 for the January of last year, and £45,126 for that of 1889, being a decrease of £12,734 as compared with January, 1890.

The plate and plated and gilt wares exported last month amounted to £24,746. The same month of last year showed a record of £29,038, and that of 1889 £27,061.

The total value of imports for January are valued at £33,741,082, in comparison with £38,143,850 in the same month of 1890 and £38,058,318 in that of 1889.

The exports figure at £19,834,315 for last month, and in the January of last year they were £21,586,752, and in that of 1889 £20,527,637.

Notes About Town.

(By our London Correspondent.)*

Presentation to Mr. Alexander Baum.

THE wisest man that ever lived said, nearly two thousand years ago, a prophet has "no honour in his own country," and many a man to-day, whilst lauded with an almost god-like reverence in the world amongst which he moves; is by those of his own household and those who are brought into hourly contact with his un-artificial nature, barely respected. Judged by this standard and by the recent actions of the employés of Messrs. Baum in regard to Mr. Alexander Baum, we must say, "Behold, one greater than a prophet is here." Now that Mr. Alexander is no longer in his accustomed position, his loss is being felt by the staff; and, as an expression of the respect they feel for him, which now appears intensified, if possible, by the realisation of his absence, they have lately presented him with a very handsome case containing a solid silver cigar case, cigarette case, and match-box, ornamented with the appropriate monogram of the recipient. We congratulate Mr. Alexander Baum upon the kind and gentlemanly disposition which has thus won the good affections of a staff of employés. Such characteristics, fortunately, do not go unappreciated in these days.

* * *

Artificial Rubies.

For the last two months several gentlemen of foreign appearance, the minor side of middle life and of medium height, have been paying visits to the trade with parcels of coloured stones, a few fine diamonds, and some "very fine rubies." I happened to call upon a very old house whose colored stones, in my youth, made a life-long impression not only upon *my* mind, but the mind of many others with whom I am brought in contact. I was then favoured with the sight of one of these gentlemen, who inquiringly remarked, "You are a buyer of fine rubies, I believe?" "Well, yes, some times, but I have not had the pleasure of doing business with you." "No, but Messrs. K. R. L. F. and numbers of others in the Garden know me, as I have done business with them. Let me show you what I have." And upon this he produced his pouch, taking from it a small parcel of twenty or thirty carats of "Siam." "Oh," said my friend, "these are not the class of goods I buy, at any rate not in small parcels like this." "Well, do you want fine Burma, then?" Upon this he drew forth another paper with a few poor, but what might certainly pass as Burma. Finding these met with the same fate as the first, he replied, "Oh, I see; you want the real fine pigeon's-blood colour. Well, if you do, that's just what I've got." And forthwith he took out another paper with four certainly very fine-colour specimens. I had the pleasure of looking well into them, but it is only right to say that we had just been informed he was about, and suspected our man from the first. I examined them, and, to obtain fresh draughts on his patience while I did so, I eulogised them up to the ideal. But, alas! the platyscopic lens which I always carry in my pocket at once revealed their structure—they were manufactured! Although there was just the slightest suspicion of milkiness in two of them, and their colour approached as near as possible to the true one, they were at once monochroic, as one let the light pass reflected from the pavilions it flushed up in a red of two hard monotonous shades, and one missed in a moment the TWO reds that would have resulted from the dichroism of a ruby of a similar hue. Turning them up to the window, and viewing them by transmitted light, the counterfeit became still more apparent, for here we got an immense amount more light transmitted than could have been transmitted through the highly refracting ruby; and, further, instead of polarizing the ray by double refraction, simply acted as a colored glass prism and decomposed the light. I looked into the eyes of my friend inquiringly; this he understood, and replied, "Oh, no; it's not worth the trouble." And folding up the "treasures" again, returned them with a "No, thank you; won't suit." Seeing they would not, he put them in his pocket, and quietly walked away, with the assumed air of a *business* man! As one gazes on a scoundrel like this, a very curious mixture of feelings creeps over one—a kind of paralysis of what one really ought to do under the circumstances; you are morally sure that his intention is to rob you or anyone else he can, and yet to prosecute such a fellow would be a most difficult and expensive proceeding! I am sorry to say that I heard it on the best authority that the villain was successful in more than one instance; but, while we sympathise with the duped as falling a victim to rogues, our commiseration is modified by the unwise policy of men who trust to "rule of thumb," and affirm, like an American contemporary, "there is no test except the sight based upon experience." All the phenomena exhibited by gems (and manufactures too) are amenable to laws, and those laws constitute the elements of the science that underlies our profession or trade.

* * *

The Barnato Lodge of Freemasons is looked upon as the diamond or representative lodge of Hatton-garden, and it was natural, therefore, that there should be an important gathering of the wholesale trade at the annual ball held on the 12th ult. at the Whitehall Rooms, Hotel Métropole, in aid of the Lodge Masonic Benevolent Fund. The dance was essentially the dance of the season. The W.M., Bro. E. J. Acworth, a well-known habitué of the Garden, had made excellent arrangements, and was supported by representatives of the Grand Lodge in the persons of Mr. Sheriff Augustus Harris and Mr. Edward Terry. Then there was the "Diamond King," Mr. H. J. Barnato (of the London and Kimberley firm of merchants), Mr. Isaac B. Joel, Mr. M. J. De Leeuw, Mr. F. B. Phillips (17, the Garden), Mr. Hugo Warner, Mr. E. J. Whiteway, and Mr. M. J. Jessop, and a host of others, making an exceedingly brilliant company. Music was discoursed by Coote and Tinney's band, and high satisfaction at the success of the ball was evinced on all hands.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

The Trade of the Country.

In London we hear good news on many sides as to the state of trade, but retailers generally are grumbling.

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Messrs. George are still a long way behind with orders, although they are using their best efforts to get them out.

* * *

The British United Clock Company, Farringdon-road, report trade good, and since Christmas some good shipping orders for the Colonies. They are also busily engaged upon getting out some new patterns of novel clocks. Other firms speak in terms not so satisfactory.

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On another page we give a description of a special piece of work lately turned out by Messrs. T. and J. Bragg, of Vittoria-street, Birmingham. They have also another Mayor's chain on hand for Bishops Castle, and report that they are fairly occupied with orders, more so than with sales.

* * *

Messrs. J. Goode and Son, 3, Regent-place, Birmingham, are perhaps not quite so busy as they have been, but they are having a little time to work at their new catalogue, which it is intended to make much larger than the old one, and to incorporate their new designs. If there is one thing in which there have been greater changes of styles than another during the last two or three years, it is assuredly in ladies' alberts. We hope our readers will soon see some of these illustrated.

* * *

Messrs. Vaughton, of the well-known Gothic Works, Birmingham, have any amount of orders on hand, and they are still coming in; the firm, however, have reason to think the orders might be larger, even if fewer. One thing is very patent to all, and that is that there is a larger increase all round in the demand for medals and badges. The other day we saw a gentleman order a silver medal which *he* was going to present to his son on leaving school. We have been struck with this increase for some time; and Mr. P. H. Vaughton, who has lately returned from London and the South, finds "that the taste of the public in that part of the world is certainly improving, as far as regards heraldic jewellery and insignia, the Gothic style fast growing into favour, and displacing the classic and nondescript, which has had so long an innings."

* * *

Messrs. Ginder Bros., 47, Frederick-street, Birmingham, have just completed their building alterations, the premises being now divided up into three departments, viz., postal, jobbing, and sale or return. The offices are divided only by a glass partition from the manufactory. As this is their own property, we can understand why expense should have been so little spared. A member of the firm is always presiding in the new office (56ft. × 20ft.), having the whole business under his direct supervision. The firm informs us that they are still running their speciality—rings—new designs in which they claim to introduce every day.

* * *

Mr. T. Webb, 19 and 20, Great Hampton-street, Birmingham, and 18, Cross-street, Hatton-garden, London, and Manchester, is going along to his heart's content, especially with foreign orders. His specialities are such as are often required, but there are few houses who lay themselves directly out for them. They include knife charms, combination knife, pen, and pencils, etc.—articles of useful knick-knack cutlery, which one usually has to get, not so much for what they are objectively, but for a customer, who is thereby prevented from going somewhere else.

* * *

Mr. F. J. Carver, 1, Prescott-street, Hockley, Birmingham, reports trade very good, "fresh customers always increasing through our advertisement in the *W. J. & S.* We shall be obliged to extend our working facilities, present space being quite inadequate." Mr. Carver encloses us a price list for every description of watch and jewellery jobbing. But as we look over it we cannot help asking—Is it really necessary to cut some of these prices so low? What should we have thought of such quotations years ago? All our readers should obtain this jobbing price list.

* * *

Mr. B. J. Round, 9 and 10, Northampton-street, Birmingham, has taken into partnership his two sons, who are both well known to the trade, having passed through all the various branches with their father; Mr. B. J. Round, jun., acting as assistant-manager with his father, at the Northampton-street Works, and Mr. A. taking charge of the Albion-street branch.

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Mr. W. H. Brown, 15, Great Hampton-street, reports: "Jewellery department extra good; material well up to average; large orders for Sierra Leone for materials and watches."

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Mr. J. W. Caldicott, 128, Great Hampton-street, also reports trade as being good.

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Messrs. G. E. Walton and Co., 52, Hylton-street, after strengthening reserve fund, declared a dividend of 17½ per cent. Their clock department is growing extensively, especially in novelties and new designs.

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Mr. A. Sydenham reports: "The demand for name brooches (advertised in your valuable paper) exceeds all expectation; all jewellers should keep them." He is also just finishing his new catalogue of agricultural and other medals. When ready, we should advise our readers to send for it.

* * *

The enterprising firm of Ahronsberg Bros. (the jobbing house of Birmingham), of Albion-street, have just brought out a novel emblematic bridesmaid's brooch. We have had one submitted to us, and certainly think its construction carries out fully the idea that its name conveys. The following is a description: Cupid's bow and arrow crossed, emblem of love with a wedding ring encircling the centre, emblem of union, whilst a dove perches on the top as an emblem of peace; within the spaces on each side of the bow are the initials of the bride and bridegroom respectively, whilst the monogram of the bride after marriage is placed within the ring. The design is registered and made in gold only, or set with gems.

* * *

Mr. F. Derry, Hockley-street, Birmingham, reports trade moderately good—much jobbing being done. Two new illustrated catalogues of prices and patterns, revised to date, have been published this month by him.

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The English Watch Company, Limited, 45, Villa-street, Lozells, Birmingham, report that trade continues very good. They have several contracts in hand for railway-guards' watches; also for Kew certificate chrono-micrometers for the India State Railway. They have just patented a calendar watch, the calendar being of independent action to the watch; its application is simple, effective, and can be supplied at a very nominal cost over the ordinary watch. It will be some weeks before it is ready for the market. The same firm have new shopping in course of erection to accommodate some 80 hands.

Messrs. Bunn and Dick, 18, Grey-street, Newcastle-on-Tyne, report trade as fairly good. Good year last, but better this up to the present.

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Mr. R. L. Rennison, 29, Bridge-street, Sunderland, optician to the Sunderland and North Durham Eye Infirmary, reports very favourably. He keeps a staff of nine men employed on the premises.

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Mr. J. Preston, 16, Houlston-street, Prescot, Lancashire, reports that although trade is good, prices are kept low through foreign competition.

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Mr. W. Fleming, of High-street, Dunbar, reports trade good.

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Turning to Coventry, we much regret the first thing we have to chronicle is the change in the business of Messrs. Newsome and Co., occasioned by the late lamented death of Mr. I. J. T. Newsome. We are, however, glad to know that the business will be carried on as usual by the surviving partners, Messrs. I. K. and S. T. Newsome. Things are still busy; their patent safety-wheel going-barrel work especially being in great demand.

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Messrs. A. Edwards and Co., 12, Spon-street, Coventry, report the demand is still increasing for their safety centre-wheel, while trade in general is also good.

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Messrs. E. G. Draper and Co., Globe Works, Sheffield, whose special line, although a little out of the ordinary, is often extremely handy to know, inform us that "bronzing opened at the beginning of the year very quiet indeed. Orders are now coming in, and we are fairly busy. Nickel-plating has been brisk ever since Christmas—in fact we have been rather behindhand in the execution of orders. We have in hand an extensive order for bronzing coil cases; these are made in cast iron, with scroll-work panels, and are to be used for covering coils of steam piping fixed for warming purposes in a large public building on the Continent; they are bronzed a rich chestnut-brown, and look very effective. We have also recently executed some rather large orders for re-nickel-plating the brass fittings of several large ocean-going steamers; work of this kind reaching us from various seaports, where refitting of vessels is going on. In the artistic decoration of stove grates and fenders, our Art bronze, antique, and Victoria bronzes constantly employ a staff of workpeople, whose skill and taste in transforming an iron casting into a beautiful piece of art work would astonish many people not conversant with the Sheffield metal trades."

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Messrs. Atkin Bros., of Truro Works, Sheffield, are as busy as ever, and are still on that uninterrupted march they have been enjoying for so long, which must necessarily have a stop some day, or else one wonders what it would come to. But despite all this amount of trade, there is all that consideration and trouble-taking, characteristic of a young man wanting to get on. The business is permeated with the members of the firm and their sons, and it is difficult to say in whom these sterling qualities are best represented.

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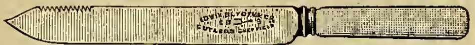
Messrs. M. Willis and Son, Exchange Works, Rockingham-street, Sheffield, report they are very busy with general orders, they having made the mounted fancy china a speciality, and are delighted with the success attending many of the patterns; and they also report an increase generally in the E. P. and B. M. goods.

Messrs. Edwin Blyde and Co., Sheffield, report that they commenced the year very well indeed—never better—being especially busy in their much improved imitation ivory (ivoride) table knives, fish and dessert ditto, and fish carvers. They are just about to patent a very important improvement in these things, both as to securing the handles of same and obviating a defect at the bolster or shoulder of knives, etc., made from this new material, the only complaint hitherto being a slight shrinkage at the shoulder, where the handle joins the blade. Their registered saw-back carver is selling both in stag white bone, ivory, and ivoride. The newest ivoride ware now sending out is very rich in colour, and resembles the best African ivory, and requires an expert to detect the difference.



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Mr. A. Speed, of King's Lynn, writes:—"We should have very little cause of complaint if we could only overcome the unfair competition of unlicensed persons who infest this district—I suppose in common with many others—and carry for sale watches and jewellery, and form clubs, to the utter ruin of country watchmakers. I may say, without exaggeration, every other person has at the present time a watch or some article of jewellery for sale, and drives a thriving trade under the very nose of the excise authorities. Legitimate competition is good, and we have quite enough of it in that way, *i.e.*, about twelve or thirteen stocks, besides repairing businesses, in a town of under eighteen thousand inhabitants, is keen enough. But the illegitimate trading is, as I said before, simply ruinous. I should like to see the plate licence raised to £5, and all persons forming clubs, and all dealers in gold and silver, irrespective of weight of article sold, in common with the general trade, amenable to it. This, I am sure, would remedy our greatest grievance, and place the trade on a sound foundation."

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Mr. Thos. Platt, 21, Houghton-street, Prescot, Lancashire, reports that trade with him is "very good."

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Mr. W. Rogers, late of 11, Cork-street, Liverpool, has removed to Queen-avenue, near the Town Hall. He was one of the earliest advocates of keyless watches, when they were by no means in popular favour.

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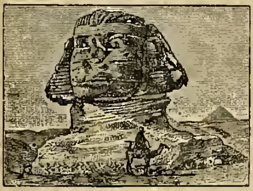
Messrs. Nathan and Co., Mulgrave-street, Liverpool, report they are very busy with their series of photographs, having recently visited several of the places depicted, which include Egypt, the Suez Canal, Arabia, Turkey, the Holy Land, etc. They have arranged for a regular supply of these large and striking photographs. In addition to numerous places and objects of interest, the series includes native groups, Soudanese warriors, Eastern beauties, etc. The accompanying block is one of their series, but does the photograph great injustice.



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News from Lincoln is not perhaps so good as it might be. The same may be said of the information supplied us from several Scotch cities. All through the country we can, however, congratulate ourselves that trade is certainly satisfactory for February, the worst of all months.

Midland Jottings.

(By Our Birmingham Correspondent.)*

THERE is a distinct falling off in business to record this month. Some branches are almost at a standstill, and nearly everyone is complaining of want of orders. Various reasons have been assigned for this, but none of them reach the difficulty. Of course things are not so bad as to promise another serious crisis in the trade such as was felt a few years ago. They would have to be many times worse for that to be said.

MEANWHILE the status of the trade is undoubtedly improving, and this is chiefly due to the continued success attending the efforts of the Jewellers' and Silversmiths' Association, which has now assumed imposing proportions. Since this time last year its numerical strength has been increased by as much as twenty per cent., and still its committee is unsatisfied, and cries out for more. It is now undoubtedly a great power, and so far a benevolent, rather than a dominating one. It is gradually acquiring all those attributes which distinguished the old trade-guilds of London and the Continental cities. It is essentially a society for the protection of the rights of the trade it represents, and for furthering those interests in every way possible, and, in addition, it is to raise the standard of the manufactures of the industry, and above all to make the Birmingham jewellery second to none, and prevent the late general borrowing of foreign and alien designs.

IN its protective capacity the Association is likely to prove of immense pecuniary service to its members, and for no other reason it behoves every manufacturer to pay his subscription. He then becomes entitled to the help of the Association in any case where he experiences difficulties in getting in over-due accounts. For this purpose a Debtors' Prosecution Fund is in existence, and already more than £3,000, which had really been given up, has been reclaimed. From this sum the Association deducts ten per cent. for its own expenses, and when any surplus is left it is added to the fund. It will thus be seen that as this kind of operation is extended a really great sum will annually be saved to the trade.

A DEVELOPMENT of this branch is the detective aspect of the Association's work. It frequently happens that a debtor disappears, and is no more heard of for several years, when he returns and again engages in business. This in future will be impossible, for no one will engage in the trade whose previous history is not known, and if any events in this history tend to prove that liabilities have been evaded, the debtor will not now escape the penalties. This will tend to make the trade generally more stable, and prevent many abuses which are now common. Besides the one denoted above, another practice it is intended shall be abolished if it is at all possible, and this is the systematic robbery of "brimstone" as it is technically called in the shops. This is the dust from the benches, which is frequently removed by boys and apprentices at the instigation of men, usually of the betting class, who get hold of the youths and bribe them, telling them at first there cannot be any harm in bringing away rubbish. When it is remembered that some 400,000 ounces of gold alone is used in the jewellery trade in Birmingham every year, it will be understood that "brimstone" is no mean item. If this can be saved, where now it is pilfered, another economy will be effected. If the vigilance of the Association can accomplish anything in this direction, it undoubtedly will do so.

PERHAPS what is destined to become far and away the greatest work of the Association is the Art and Technical Schools, to which I drew attention in these columns when they were opened last year. Since then great strides have been made. Four hundred and fifty students have applied for admission to the Art Department and seventy to the Technical Department, which will be further expanded so as to take forty on each of the three nights when instruction is given. The accounts of the Technical and Art Schools Fund show a balance of over £280. A new development is to be the establishment of courses of lectures on technical subjects for the students already training in the room provided by the Association.

THE third annual dinner of the Association at the Great Western Hotel was a very successful function. Mr. Walter Best occupied the chair. Almost all the leading members of the trade were present, and the company included a number of distinguished visitors, among whom were the Rt. Hon. Joseph Chamberlain, M.P., Sir Philip Magnus, Mr. Jesse Collings, M.P., Alderman Kenrick, M.P., Mr. Powell Williams, M.P., Mr. E. R. Taylor (Head Master of the Birmingham School of Art), and Mr. Whitworth Wallis, F.S.A. At the annual dinner both Mr. Joseph Chamberlain and Sir Philip Magnus spoke in the highest terms of the work which the School was doing. In connection with the visit of Sir Philip, who, it will be remembered, is the Principal of the City and Guilds of London Institute, a reproach on the Institute is to be removed by the Birmingham Association. Although the Institute includes "silversmiths' work" in its prospectus as "section 25," yet no syllabus is given for that subject. The Birmingham Association have therefore been invited to draw up a syllabus in two sections for this department "25," to include gold and silversmiths' work, which when approved will be included in the Handbook and in the 1892 Examinations. The students of the Birmingham school will be tested as to their knowledge by the City and Guilds of London Institute staff of examiners.

A CONSIDERABLE boon to silversmiths, and to jewellers also, though in a less degree, will be the cheap supply of oxygen in the steel cylinders which the Oxygen Company, Limited, of Saltley, are now laying down an extensive plant to supply. The gas is produced at a very low rate by Brin's patent process, and will undoubtedly be largely used wherever a considerable amount of hard soldering is done.

AT the Exhibition of Cycles, held at the recently-opened Winter Gardens in Birmingham, Mr. A. Fenwick, of 16, Augusta-street, has an excellent case of medals on view, including medals suitable for Photographic Societies, Horse Shows, and Dog Shows, and in this connection he has a special medal, with the heads of ten dogs engraved thereon, and the breed of each dog is easily recognised. There are also medals for Agricultural Shows and for all kinds of sports, including shooting, cycling, etc. Mr. Fenwick is also manufacturer of badges of every description, rings and seals for wax, carat and initial punches, checks, and labels. The quality of his work may be depended upon, for he was with Mr. J. Moone, the premier medallist of Birmingham, for more than twenty years.

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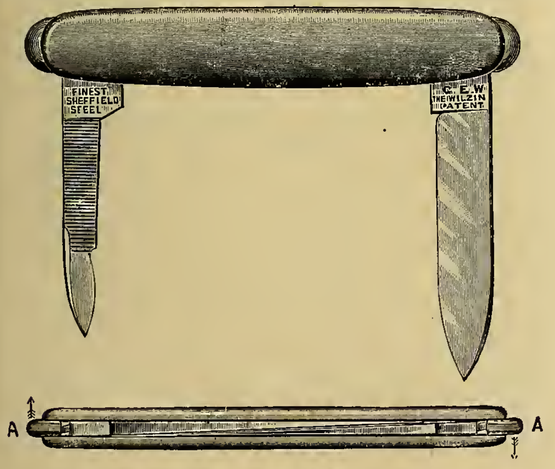
* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

“On Approval.”

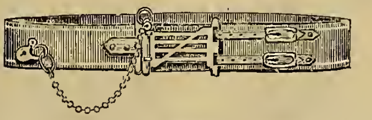
NOW that so many of our jewellery houses, to say nothing of diamond merchants, have businesses in New York and elsewhere, a recently settled point of American law may be extremely interesting and valuable. The decision was rendered in the old suit brought by Alfred H. Smith and Co., diamond dealers, of New York City, against Henry Clews, a broker. The principle involved was the ownership or title of goods sent out “ on memorandum,” as the practice is commonly known. The suit was decided in favour of Messrs. Smith and Co., and their plea sustained, which in substance is that the title of goods sent out “ on memorandum ” remains with the owner until an invoice is given on the received actual payment for them. The decision established the fact that a person receiving goods “ on memorandum ” cannot sell them to others with a clear title, simply because they themselves have not acquired such a title themselves. And, further, that possession of personal property does not insure ownership, and that even innocent purchasers must surrender goods bought in good faith to the owner, when his title is established. The suit has been long—nine years—and hotly contested at eight trials and appeals from former verdicts.

Messrs. G. E. Walton and Co., 52, Hylton-street, Birmingham, have sent us a sample of the Wilzin Automatic Knife for inspection, and there certainly are features in it which will commend it to many. Firstly, it obviates the nuisance of useing and often breaking the thumb-nail in opening.



Secondly, it is instantaneous in its action; and, thirdly, it is made in best quality only. The shutting of the knife is effected as easily as in any other; its position of rest in relation to the back spring is about half an inch open; when pressed closer than this it is gripped by a spring, from which it is released by a side pressure of the projecting piece A in the annexed wood-cut. The blade then immediately flies up, and can be clutched with the gloved fingers and fully opened.

The accompanying cut illustrates a new and attractive belt—the novelty consisting in the gate fastener—which



has been introduced by Messrs. A. Garstin and Co., of Queen’s-square, E.C. This should have a good sale.

Sheffield Notes.

(By our own Correspondent.)*

THE conversazione of the School of Art has been held this year, as last, in the Mappin Art Galleries. As far as the lay public is concerned this is no doubt a great improvement on the old style under which the annual distribution of prizes, speech, and conversazione took place in the School of Art. Nevertheless the old building in Arundel-street had a charm of its own, especially for the students who naturally felt at home in it. Their Bohemian instincts, moreover, were gratified in sipping coffee with their lady friends in the midst of fragmentary specimens of the Ghiberti Gates and other masterpieces—the materials of their nightly studies. The world, however, cannot stand still, and if the course of the Empire of Art takes its way in the direction of Weston-park, why, we must e’en go with it.

IN one respect, however, I think few will venture to maintain that this year has been an improvement upon previous ones. Hitherto it has been the laudable custom of the Council to bring some authority upon Art matters to give an address to the students, in the course of the formal proceedings which take up part of the evening. On this occasion the task devolved upon the Duke of Norfolk, who, although he owns the land upon which half Sheffield is built and derives the greater part of his princely revenues from the town, seems to be entirely ignorant of the fact that the manufacture of silver and electro-plated goods forms part of the staple trade of Sheffield. Such at all events may be inferred from an apologetic observation which his Grace made, to the effect that although an art education might not be considered of much use in the carrying on of the staple trades of Sheffield, yet that it had an elevating tendency generally. Now, as a matter of fact, the majority of the genuine art students are connected with one or other of the numerous branches of the silver trade. The reason of this is not far to seek. The roller of an armour plate may or may not have a taste for drawing, but in the nature of the case an engraver or chaser must. Hence the silver trade from the very commencement of the school has always constituted the backbone of the institution.

ONE other trade—the stove grate trade—has always run the silver trade very close. We are reminded of this by the death the other day at a ripe old age of Mr. Henry Hoole, the founder of the industry in Sheffield. Previous to his time the manufacture of stove grates was carried on only in London and Edinburgh. Very soon, however, after the establishment of Green-lane Works, Sheffield had a practical monopoly of the industry. This result was achieved by the readiness with which Mr. Hoole took advantage of the exceptional facilities for artistic treatment afforded by the conformation of the article he made. In a very short time stove grates of a high degree of artistic excellence became the rule. Some years ago, before the old houses at the bottom of Coal Pit-lane were pulled down, the art student who had courage enough to enter some of these dens was rewarded by the sight of some of the earlier specimens of these stoves, and felt himself fully compensated for any risk or inconvenience he incurred in the course of his search. The trade employs a very large number of modellers and designers, all of whom have been trained in the Sheffield School of Art.

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* We must not be understood as endorsing all, or necessarily any, of the views our correspondent, who writes on his own responsibility.

ANOTHER connecting link with the past has been broken in the death of Mrs. Fawcett, of Clarke House, the other day, at the advanced age of eighty-three. Mrs. Fawcett was one of the daughters of James Dixon, the founder of the firm of that name, a fact which enables us to realise the length of time which separates us from the commencement of the plated trade in Sheffield. The late Alderman Fawcett, who was also a partner in the firm of James Dixon and Sons, predeceased his wife as far back as 1864, at the age of 57. The Fawcetts and Dixons, who form a numerous clan, many of them inhabiting the old mansions of an extinct squirearchy, are all partners in the old firm, which is still managed with as much energy and ability as at any former period of its history.

THE time for the declaration of dividends is at hand, and it is satisfactory to note that so far this year is not inferior to last. As regards the heavy trades, the most avaricious shareholder could scarcely expect it to be better. Bessemer and Co. have declared 25 per cent. and a substantial balance carried forward to next year. Brown, Bayley, and Dixon (to use the designation of the older and better-known firms) have declared a similar dividend. Of course the shareholders in the Silver and Electro-plate, Limited, do not look forward to returns like these. Iron and steel are much more precious metals (to their manipulators) than silver or gold. Nevertheless there is every reason to believe that the result of the year's working in their case also will be satisfactory.

THE Corporation have invested in a clock which is intended to be a check on the watchman in a certain department. It is a clock in which a peg has to be removed at a certain time by the watchman, or the clock stops, and thus it is known that the watchman has not gone to sleep. This is perhaps not so much of a novelty as the sparkling wit of which it was the occasion in the Town Council. One member asked, for the protection of the watchman, whether the clock would strike. "No," said the chairman of the committee, "it won't strike a watchman." One is not surprised to read that "loud laughter" ensued.

ANOTHER clock, by which it is intended that all men and sundry shall henceforth set their watches, to say nothing of its secondary object—an advertisement for Mr. H. L. Brown, in whose window it occupies a prominent place—may here be mentioned. When a certain learned Government official (so we are informed) shall have examined the clock, an electrical contrivance will be attached to it, and the period of one o'clock indicated by a flash signal, which shall be visible to all who are watching for it at that hour.

I AM rather surprised though at Mr. H. L. Brown having anything more to do with electricity. He is very fond of telling his friends that it is a very expensive thing. There is that beautiful display of incandescent lamps which lights up his artistically set-out windows of a night. When you admire it he shakes his head and says, "Ah, but it costs a great deal of money." Singularly enough, however, it is not the 6d. per Board of Trade unit which he pays for his electric current that he objects to, although that is rather more expensive than gas. It is rather the comparative frequency with which the carbonized filaments of the Edison and Swan lamps break, which constitutes what he considers the excessive expenditure in electric lighting. This is no doubt irritating, but all jewellers who contemplate adopting the electric light would, nevertheless, do well to follow Mr. Brown's example rather than obey his precepts. He has evidently no intention himself of parting with electricity in any of its forms.

THERE does not seem at first sight to be much affinity between the craft of the silversmith and the paving of the streets. Nevertheless the latest idea in wood pavement has been developed in the brain of Mr. Ernest Hill, of Charles-street, an old and respected member of the trade. The novelty in the new pavement consists in its being a combination of steel and wood—the steel being inserted at the corners of the blocks, which are smaller than the wooden blocks at present in use for paving purposes. The inventor claims that the new pavement will be more durable and less slippery than the wooden pavement at present in use. The invention will be worked by a company which has just been formed for the purpose.

JOSEPH RODGERS AND SONS, LIMITED, have declared a dividend at the rate of 12½ per cent. It would have been more but for the anticipated effect of the McKinley tariff, which, in the opinion of the directors, necessitates a larger balance being carried forward to next year. This they have accordingly done. This is the third year in succession that the company has declared a dividend at the rate of 12½ per cent.

The Birmingham Assay Forgery.

AT the Lancaster Assizes, before Mr. Justice Day, Robert Scanlan (42), jeweller and watchmaker, Orchard-street, Preston, was indicted for having in his possession at Preston, on January 30th, 1889, an albert chain of base metal, and stamped with a 9-carat gold hall-mark stamp provided or used by the Company of Guardians of the Standard Wrought Plate, of Birmingham. There was also another similar charge, and one of feloniously uttering chains, knowing them to be forged and counterfeit. Mr. A. Young and Mr. Shee conducted the prosecution, and Mr. McKeand represented the prisoner. Prisoner, on the advice of his counsel, pleaded guilty. Mr. McKeand said that after reading through the depositions he had taken upon himself to advise his client to take the course he had done, and asked that he might be allowed to call two or three witnesses on his behalf. In that matter it was most melancholy that a man, who so far had been an honest man, should have got into difficulties. His Lordship asked what he was. Mr. McKeand replied that he was a jeweller in Preston, and was a respectable man, and he did not think that his friend would attempt to disprove what he was about to say. As the prisoner explained to him, he had unfortunately got into his possession these counterfeit articles, and finding that, he had given way to the temptation to defraud others. That was open to the observation that it seemed a very serious thing that there should be in the possession of the prisoner so many spurious articles. He was instructed, however, that a large number of these articles were being circulated about the country. Of course it was essential in the interests of justice that Scanlan should receive fit and proper punishment for his crime. His Lordship asked Mr. McKeand if he was in a position to indicate the names of the other persons. Mr. McKeand said he was not. Mr. Justice Day said it might be as well for him to give all the information he could to the prosecutor if he sought to mitigate the punishment. Mr. McKeand afterwards held a consultation with the prisoner. His Lordship passed a sentence of five years' penal servitude.

THE premises of Mr. John Richardson Stevenson, jeweller, 447, Bethnal Green-road, were recently broken into, and a number of silver watches, gold albert chains, and other articles of jewellery were stolen. Two young men have since been identified as the offenders, and stand committed for trial.

Horological Notes.

ORIGINAL AND "CLIPPED."

Chronometers and the U.S. Naval Observatory.

SOME rather severe remarks have lately been passed upon the paucity in the numbers of ships' chronometers tested at Kew. We have recently received from Mr. R. Strachan a report on the subject of the United States Naval Observatory, which shows quite another state of things on the other side. We hope to refer to this at greater length on a future occasion, contenting ourselves at present with a few extracts. In regard to the chronometers tested, it appears they observe the degree of humidity as well as the temperature. There were 34 chronometers tried, and their trial numbers ranged from 6·4 to 80·1. Their temperature constants ranged between + ·00013 and — ·00525. The temperature of compensation varied between 46deg. and 73deg. The mean temperature of the twenty-one weeks' trial was as high as 89deg., and not lower than 51deg. The degree of humidity, estimated weekly, was between 53 and 73, a comparatively dry atmosphere. As many as 24 of the instruments bear the name T. S. and J. D. Negus, and they grace both extremities of the list.

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Big Ben's New Sister.

There are some men who are always looked upon as great men because they accomplished some special act. There are many whose greatness is dependent upon their natural parts, and with growing years they reach their meridian of fame, and then they just as gradually fade and wane. But there is also the truly great man—the man who is great all his life; and when that period of life comes, which in many is represented by retrogression, he seems blessed with a perpetual rejuvenescence of mental activity and vigour, and is ever ready to bring long and varied experience to bear upon the problems which present themselves for solution. Of this class of man is Lord Grimthorp. A father in horology, he has mastered some of the greatest problems connected with the science; and has laid posterity under obligations to him that will never be paid. It is, therefore, with pleasure and pride that we have to call attention to a clock which his lordship has just constructed for the General Post-office, Sydney. It is claimed to be the largest clock that has ever left England; in addition to which it possesses some very novel features, notably the conveying the time by an electric flash of five seconds' duration at each hour during the night many miles around. The clock has been constructed by Messrs. J. B. Joyce and Co., Whitchurch, Salop.

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Standard Time.

A Bill for the adoption of standard time throughout the United States has been introduced in Congress by Representative Flower. A number of scientific bodies have sent in resolutions urging action by Congress. It is desired to secure Congressional action in order that it may form the basis of similar action by European Governments and the adoption of a standard division of time throughout the world. At an international congress held in the United States in 1884 a standard division of time was considered, and for diplomatic reasons the Governments represented desired the United States to take the initiative. Mr. Flower's Bill provides that time throughout the United States shall be reckoned in accordance with the hour meridian system; that the prime meridian recommended by the Washington international conference of 1884 shall be the inital standard for reckoning time, and that the meridians which are a multiple of 15deg. from the prime meridian shall be the sub-standards by which the local reckoning of time shall be regulated. The commencement of the day and the notation of the hours in different time sections of the United States shall differ from the commencement of the civil day and the notation of the hours on the prime meridian as follows: In the time section where the reckoning of time is regulated by hour meridian No. 17, the reckoning shall be five hours behind the reckoning on the prime meridian; in the section regulated by No. 18, it shall be six hours behind; in No. 19, seven hours behind, and in No. 20, eight hours behind. The time sections embrace the country on each side of and contiguous to the sub-standard meridians, but the constituted authorities of any State, city, town, or village may adopt sub-standard by which to reckon time as shall seem to them most convenient, and such standard shall be recognised by the courts. The hours of the day may in any locality be numbered in a single series of numbers from zero to twenty-four, and this method of designating the hours commonly known as the "twenty-four-hour notation" shall be equally valid with that of numbering the series of twelve hours each.

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Liverpool Watchmakers in Council.

There was an exceedingly large attendance at a meeting of the Liverpool Watchmakers and Jewellers' Association held under the presidency of Mr. John Bryant. The balance-sheet and report showed that the society was making progress financially. On the motion of Mr. W. A. Newcomb, the following resolution was carried unanimously: "That this meeting of the Liverpool Watchmakers and Jewellers strongly opposes Mr. Bradlaugh's motion in favour of the total abolition of compulsory Hall-marking." It was decided to send a copy of this resolution to all the Liverpool Members of Parliament.

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The Cost of Prosecutions.

Mr. J. Berry presided over the first annual meeting of the Prescot Watchmakers' Trade Association. The society was formed to detect and prosecute cases of fraud in the watch trade under the provisions of the Merchandise Marks Act, and the committee stated in their report that one of the future objects of the society would be to secure an Act making it compulsory on the Board of Trade to enforce the Merchandise Marks Act, and thus relieve the different associations of the cost of prosecutions. Lord Derby had written, consenting to act as president. Mr. T. P. Hewitt was appointed chairman; Mr. J. Berry, vice-chairman; Mr. J. Morton, treasurer; and Mr. W. Lloyd, secretary. The Association bears the promise of great usefulness.

Watch and Clock Making.

(*Continued from page* 168.)

Answers and Notes to Questions set at the City and Guilds of London Institute Examinations.

By I. Hermann,

Director of the Polytechnic School of Watch and Clock Making.

QUESTION (6).—Explain any device for maintaining the movement of a watch or clock during the time of winding.

Answer.—The device generally employed in regulators and the best spring clocks with fusees, and universally in fusee watches (verge watches excepted), is known as Harrison's maintaining work, or "going fusee." The fusee, which is firmly attached to the arbor, has a recess turned out on the side of its greater radius or base, into which a concentric ratchet is fixed equal in thickness to the depth of the recess. A double clickwork, attached to a wheel (mostly of steel in watches), acts into this ratchet, and sustains the pull of the mainspring. This steel wheel is connected with the fusee driving wheel, or great wheel, by a spring in the form of an *annulus*, with a small section removed, carrying two pins at both ends adjacent to the section, one of which passes through the steel wheel, so that the pull of the mainspring closes the spring, and the pin in the other end acts on the great wheel. The first pin extends on both sides, the end on the great wheel side being used to limit the stress on the spring. The spring is always kept strained by the pull of the mainspring, and during rewinding this strain is utilised to maintain the motion of the mechanism—that is, the steel wheel that acts on this spring and keeps it in tension is prevented from yielding to the elastic force of the spring, when the stress of the mainspring is neutralised in winding, by a click, which acts into the ratched cut edge of the steel maintaining wheel. The spring's energy of restitution is thus communicated to the great wheel, and is sufficient to maintain the motion of the escapement and train during winding.

Remarks.—The invention of this maintaining work is generally credited to Harrison, the chronometer maker, who solved the problem of determining the longitude by his chronometer; but it is stated by Reid that he got his idea from a meat jack. The device described is admirably suited for small mechanism, such as a watch or small clock, but is not used for turret clocks, because it is more expedient to use gravitation rather than spring power. The oldest maintaining work known is that of Huyghens's endless chain or line. In this arrangement the driving-weight is suspended from a running pulley, and the chain (or line in some clocks) that drives runs over a spiked pulley fixed concentric to the main wheel, and under a "poise weight" pulley, and again over an idle fixed pulley, and then again under the driving-weight pulley. The idle pulley is both spiked and prevented from return motion by click work. The winding is effected by lowering the poise weight, thus raising the driving weight by that part of the string or line that runs over the idle pulley, and thus the action of the driving weight on the clock remains unaffected. There is a close analogy between the character of the winding in this arrangement and that of the going-barrel (see question 5), that is in not retracing the driving point over the distance it has acted, but extending the space over which it can act, or, what is the same thing, extending or restoring its potential energy (see question 4). In striking clocks the idle pulley is placed on the first wheel of the striking train, and thus one weight drives both trains. The conditions that characterise the motion of a chain over a spiked pulley, or of a line running in a V-shaped groove or rough pulley, makes its use objectionable for better class clocks, hence a contrivance known as the "bolt and shutter" is mostly employed. This consists of a weighted armature, rotating on a pivoted arbor. The weight of the arm is connected with one of the train wheels during winding. In its resting position it is furnished with a shutter which covers the winding orifice, so that the "winder" is compelled to put the maintaining action into gear before he can commence his work.

Another arrangement for this object lately brought into use for large clocks by a firm of turret clock makers, consists in the employment of an "epicyclic train." Reid mentions this contrivance for watch fusees, when it was known by the name of the "drunken fusee." In this contrivance a small wheel is fixed to the drum arbor, which here rotates in the drum. This wheel gears into two others, whose centres of motion are fixed on the drum, and which gear into a wheel rigidly attached to the main wheel. In winding, the intermediate wheels form virtually levers of the second order, where the winding force represents the power, the force communicated to the drum, the weight, and the pressure at the fulcrum, supplying the maintaining action. If the reader uses any straight rod, holding it at one end, and rests the other end on some rigid point, and suspends a weight between both ends, he has a practical illustration of a lever of the second order.

Question (7).—Explain the mode in which the stopwork applied to the ordinary going-barrel acts?

Answer.—The stopwork used almost exclusively in going-barrel watches is known as the "Geneva stopwork." The finger-piece, which rotates with the barrel arbor consists of a circular disc, the circumference of which is intercepted by a projecting tooth, that springs from two concave recesses on each side of this tooth. The companion piece is of the form known as the "Maltese cross." It is usually divided into five parts, the dividing spaces being just deep and wide enough to give a free passage to the finger-piece tooth. Four out of five of the parts into which the stop-piece is divided have concaved edges of the same curvature as the circumference of the finger-piece, planted so that the crescents lie closely to the circumference of the finger-piece, and that the finger enters freely and safely into the spaces that separate the wings. The remaining wing is convex, and thus limits the motion of the barrel-arbor when the spring is wound up in one direction,and of the barrel, as the train runs down, in the other.

Remarks.—The answer here given sets forth the duty of this section of the watch, but because many watchmakers find that "it does those things which it ought not to do, and leaves undone those things it ought to do," they do not allow it to stop on any watch that falls into their hands, lest it should act as a stopwork to the watch, instead of to the spring. If it could be ascertained how many out of a hundred watches imported would be despoiled of their stopworks within two years after their public appearence, I think it would be found not far short of one-half. It will not be out of place, therefore, to point out the cause, and suggest a remedy. It is not to be inferred that any great part of these are "removed" because of their failure—it is rather for fear of their failure. Many workmen act upon probability rather than rule, hence they think that by removing the stopwork they get rid of one probability for stopping. Assuming that the geometrical conditions or proportions are correct, which are that the radius of the finger-piece should be equal to half the distance between the two centres, the cause of error lies in the unstableness of the axis on which the stop-piece turns. When the stopwork is in the fully wound-up position, and lines are drawn (or conceived to be drawn) from their respective centres to the point where they touch, the angle formed by these lines is an indication of the strain on their respective centres. If these lines were at right angles the strain would be just equal to the stress applied by the winder; but the build of a Geneva watch does not permit this provision to be made, hence the angle is always greater than a right angle; and, therefore, the strain always greater than the winding stress. The strain does not only increase with this angle, but it is proportional to the product of the angle, multiplied by an increasing factor. The reader can satisfy himself of this by a very simple experiment. Take two rods and attach them to one another by a hinge, place them on a flat board or table with the free end of one rod against a fixed and rigid object, and the free end of the other rod against some movable object. Let the rods form a small angle at first, then as they straighten out with a constant pressure exerted at the hinge, the operator will find that the pressure brought to bear by the free ends of the rods against the resisting points becomes immense in excess of that exerted at the hinge.* This is the exact condition that exists in a stopwork; with the least displacement of the stop-piece the strain is increased, which at once increases the tendency for further displacement. Most Geneva stopworks have miserable provisions against this evil. The stud on which the stop-piece rotates is only a thin pipe, which soon gives way, by which the strain is increased, and therefore the tendency for further displacement, and this is the cause of most failures of stopworks. The remedy lies in a rigid centre of motion and a stopwork as large as possible, because a large stopwork admits of a firmer centre, and any displacement of the stopwork does not increase further strains so much as a smaller one. To obtain a firmer centre I recommend a mode of "mounting" that is identical with that of an English three-quarter plate index, *i.e.*, the stop-piece prepared like the rim of an index and slit, and the stud of the stop-piece left solid on to which the stop-piece is then sprung. A stop-piece thus mounted will give no trouble provided it is otherwise correct.

(To be continued.)

Lancashire Watch Company, Limited.

THE annual ordinary general meeting of the Lancashire Watch Committee, Limited, was held at the Watch Factory, Prescot, on February 6th. Mr. S. H. Hartley presided over a good attendance. The directors in their report stated that it was with considerable satisfaction they reported a net balance of profit of £4,399 18s. 11d. (including £1,291 5s. 9½d. from last year) to be dealt with at the end of the second year's working, and they recommended a dividend of 6 per cent. on the ordinary shares of the company, the payment of the dividend on the 6 per cent. preference shares issued during the year, and interest at the rate of 5 per cent. on sums received in advance of calls on ordinary shares. These payments would absorb the sum of £2,065 6s. 3d., and leave a balance of £2,334 12s. 8d. In the early part of last year the whole of the machinery acquired from the vendors was removed from the several workshops, overhauled, renovated, and refixed in the new factory, and notwithstanding the fact that that machinery was to day in better working condition than it was then, the directors strongly urged the recognition of the principle of depreciation, and they, therefore, suggested that the sum of £500 be written off machinery account. They further felt justified in suggesting that a like sum of £500 should be deducted from goodwill and trade-marks account, and that there be carried forward the balance of £1,334 12s. 8d., which would be sufficient to secure the 6 per cent. dividend on three times the value of preference shares issued last year, even if they were all immediately allotted. The chairman said it was very pleasing to him to be able to congratulate the shareholders on the continued success of the company. The report showed that the total sales for the year amounted to £22,248 11s., and compared with the sales of the preceding year, which amounted to £21,982, showed an apparent increase of £266; but it was perhaps right that he should explain to them that the sales of the preceding year included a sum of £3,300 for Wanzer lamp movements. Owing to the failure of the Wanzer Company the movements that were sold last year only realised about £300, so that their gross sales had not diminished, but increased to the extent he had indicated. He believed that the Wanzer Company had been reformed, and at the present time the managing director was negotiating with a view to the Watch Company continuing the manufacture of the movement when the new company got into full swing. At the risk of being blamed for offering the shareholders too much, the directors unhesitatingly recommended the payment of a dividend of 6 per cent. on the ordinary shares of the company, and they did that with confidence, knowing it had been more than earned. He did not suppose that any shareholder present would take exception to the recognition of the principle of depreciation which the directors had named in their report, nor that the shareholders would object to the writing off of the goodwill and trade-marks account at the earliest possible moment. It was the feeling of the directors that they should strike that item out of the books as soon as possible. He moved the adoption of the report and the balance-sheet, and the payment of the dividend recommended. The Rev. B. A. W. Norrie seconded the motion, which was adopted. The retiring director, Mr. Arthur A. Menzies, was re-elected on the motion of Mr. H. Makin, seconded by Mr. A. H. Hale. The auditors, Messrs. Banner, Spencer and Co., were also reappointed at a remuneration of £30, an increase of £5. Mr. Frederick Smith, in moving that the remuneration of the directors be fixed at £200, said he thought they must have regard to the profits in deciding the amount to be set aside for the directors. The Rev. Mr. Norrie seconded the proposition, and it was agreed to. The chairman referred to the efficient services rendered to the company by the managing director, Mr. T. P. Hewitt, who, he said, at the conclusion of that meeting, had to go to London to give evidence in a case under the Merchandise Marks Act. Mr. Hewitt thanked the chairman for the remarks he had made concerning him, and spoke of the assistance he had received in the discharge of his duties from Mr. C. J. Hewitt and Mr. James Hewitt.

Mr. Tom M. Williams, now of 125, Wardour-street, London, W., has addressed a circular to the trade. He has commenced the business of a secondhand dealer and commission broker, an opportunity having offered of succeeding to some extent to the trade connections of J. R. Williams and Son. He undertakes every description of London agency business, especially in connection with the disposal of diamond and gem jewellery, silver plate, curios and antiques, on customers' account, by auction or otherwise. Sixteen years, Mr. Williams hopes, with the eminent firm of B. H. Joseph and Co., of Birmingham, and his more recent experience as agent to the Messrs. T. and J. Bragg, will inspire confidence in his ability to carry through the several objects he is now undertaking. Those who know Mr. Williams best will wish him that amount of success he deserves.

An important paper read before the Society of Arts by Mr. E. J. Watherston, on the Hall-marking of silver plate, is held over to next month.

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*See "Goodeve's Elements of Mechanism," page 125.

Scientific and Otherwise.

Diamonds in Mexico.

FOR a number of years we have heard rumours of the discovery of diamonds in Mexico. General Vincente Guerrero, a patriot of the first Mexican revolution, claimed to have found a number which were in his possession, and which he was reported to exhibit with pride, remarking that he knew the exact spot where they were to be found, and that some day he should turn diamond king. But time has gone on and still the General has neither attempted to open up the mine or diggings, nor has he disclosed the locality to any one else. Two Americans are now prospecting near Tlacolepic, and are said to have found a number; and, further, the General has admitted they are near the spot from which his came. We have heard of similar success on several occasions, not only in Mexico but in the United States, but we shrewdly suspect that this will turn out nothing more than the finds of former years and other places. The occurrence of a stray diamond here and there, as an associated pebble in a gravel, is a very different thing from diamonds occurring in payable quantities; still, the most prolific of diamond fields have always had small beginnings.

Like an Arabian Night's Tale.

WE intend shortly to give an account of the astonishing discoveries of gold in Africa, which at present appear like an Arabian Night's tale, but as we have the information direct from our own personal friends who are now—and, indeed, have been for some years—connected with the discovery of gold in the "interior" of South Africa, and have specimens of the various reefs, one of which is *sixteen miles long!* we can speak with some degree of certainty upon it. Meanwhile, we offer the following table of the output of gold from the Transvaal during the last three years, which does not include the late discoveries, but at the same time it shows what remarkable strides the opening up of the gold reefs have made, and also its favourable comparison with the total output of the world:—

		1887	1888	1889	1890	1891
January	...	No Monthly Totals Recorded.	11,269	24,986	35 038	53,205
February	...		12,162	25,800	36,886	
March	...		14,706	28,075	37,600	
April...	...		15 853	27,136	38,799	
May ...	...		19,002	36,298	38,884	
June ...	...		16,328	31,272	37,412	
July ...	...		19,966	32,407	39 452	
August	...		19,877	32,142	42 861	
September	...		20,497	34,369	45 467	
October	...		27,775	31,914	45 250	
November	...		27,336	36,116	46,800	
December	...		26,148	39,218	50 352	
Ounces Total		34 897	230,917	379,743	494,801	
					Total to Date	1,140,438 ozs.

Unlimited Quantities of Garnets.

ABOUT twelve months ago several Cincinnati gentlemen prospecting for timber lands along some of the tributaries of the Guyon, near Grayson, Ky., were surprised at the number of garnets in the stream; they collected a half a peck or so between them, and sent them not only to the American cities but to London. When cut these turned out very fine colour and quality, though not large. Finding a good sale for the garnets the original purchasers have been for some time asking for more. As the Cincinnati gentlemen affirm they exist in absolute wagon loads, there is no doubt we shall soon have a quantity of them put upon the market.

Electric Synchronizing.

THE Western Union has been quietly introducing their system of electric clocks in various parts. Mr. C. D. Cadman, of Chicago, has been in Des Moines, Ia., making the connections and arranging it. There is one large clock at the main Western Union office which at midnight each night is corrected to the absolutely correct time from the astronomical clock in Washington. The large clock is connected with all the clocks in the system in the city by wires, and every hour by an automatic arrangement they adjust themselves exactly to the correct time of the large clock. There are already about twenty of these clocks put up in the city. The clocks are self-winding, and have a battery which runs them.

Mayoral Chain and Mace for Worthing.

THE remarkable insignia just completed for the borough of Worthing will certainly be classed among the finest civic Chains and Maces of the country. As the result of a liberal subscription, promoted by Mr. Alderman E. C. Patching, the commission was given to Mr. T. H. Crouch, jeweller, Worthing, who entrusted the design and manufacture to Messrs. T. and J. Bragg, of Birmingham. The heraldic and local knowledge of Mr. T. Ralph Hyde was of much value in this matter, and the exquisite Renaissance frame of scrolls and wrought foliations, which distinguish the chain from any other yet manufactured, are diversified and enlivened by a rich series of heraldic shields, laurel wreaths, and monograms. The Badge, which is of large size, has a series of open carved scrolls, springing from a central stem, and centred at intervals with enamelled Tudor roses, the upper ones crowned, holding four enamelled shields with the motto of the borough, and the crest of the town surmounting all. The leading escutcheon is that of the borough itself, in chief a cornucopia, from which fruit and grapes are issuing; below, alternate wave lines of azure and white, amid which three mackerel are shown passing, indicating the fishing industry of the place. Above is shown in enamel painting the figure of Hygeia, the classic goddess of Health, with the cornucopia beside her as indicating abundance. The position of Worthing as a health resort, and the rich fruit-growing district in which it is situate, are thus displayed heraldically, and the motto of the borough, "Exterra copiam, e mari palutem," further illustrates its force. On one side of the borough arms is shown the shields of Sussex, in which it is situate, and on the other side that of De Breos, the ancient holder of the district; while below are the arms of the Montagues, late owners of the manor.

The Badge depends from a centre link in bold and beautiful curves, embracing the Royal arms, motto, and Crown. From this the chain extends in symmetrical scrolls, each springing from a centre connected by double sets of links, and so bound together as to combine the ideas of strength and grace. The intermediate links have monograms "T.C.W." (Town Council, Worthing) enwreathed with laurel, also in enamel; while the larger ones have shields and appropriate coronets. The commencing one has the monogram A.C. of the first Mayor, with the usual coronet over, indicative of the office of chief magistrate. Others have the names of great owners of the district, whose arms thus afford a consecutive history of the borough up to the time of its incorporation. Thus occur the arms of the

De Warrens, of the Dukes of Norfolk, Viscount Hampden, Earl Delawarr, and lastly Thomas à Becket, Archbishop of Canterbury, in whose diocese the place was. A large shield at reverse of badge records the circumstance of the gift of this elaborate official decoration to the borough. The whole is in gold, 18-carat quality, hall-marked, and the work throughout is of the highest class.

The Mace, fully four feet in length, of massive silver, hall-marked and richly gilt, is carried out on bold lines, with an equal attention to detail. Like some of the finest ancient specimens, it has the Royal arms on the summit above an open pierced globe, as also in the seal-like termination at the lower end. The bold arms of the Crown portion descend to the fillet with fleurs-de-lis and Maltese crosses, and the band has the initials forming the name of the borough, on jewel-like projections, in enamel. The British lion standing on the globe occupies the centre within the Crown, below which comes the inscription. The vase part of head of Mace is divided by Tudor arches, with interspaces occupied by the fruits grown in and about Worthing, supported by four mermaids as Caryatides, finally executed in repoussé, and each of them bearing enamelled shields. The starry sky and the sea form a remarkable background, while hanging from the centres of the arches are also four principal shields. First of these is the shield, crest, and motto of the borough before described, opposite the arms of Sussex, between the coats of De Breos and Montague. The shields held by the mermaids respectively are those of De Warren, Norfolk, Delawarr, and Hampden. Below the vase head of Mace are three massive griffins with wings, varying the line of stem, and richly decorated knops intervene, worked in repoussé with laurel, acanthus, and seaweed. Some are again interspersed with arms and monograms. The lozenge shield of the Princess Augusta, daughter of George III., who first brought Worthing into notice as a health resort, occurs on one, with her coronet over. Also we see the shield of Thomas à Becket in enamel. Another bold moulding has the arms of Shelley and Mowbray families, related to the district, with the monogram of the borough and of the first Mayor. But the special feature of the column of the Mace is the twining series of bands in repoussé, all having emblematic significance. One band has amid national emblems, rose, shamrock, thistle; the British lion rampant, the Scottish lion with sword and sceptre sejant, and the Irish crest—a hart leaping from a castle gateway. Another band has the mackerels of Worthing, sporting amid shells and seaweed. A third has grapes, tomatoes, pine-apples, etc., in graceful flowing lines. The fourth has the serpent-twined staff of Esculapius, the symbol of curative power; the caduceus of Mercury, the emblem of commerce; and the cornucopia, of abundance. The lavish ornament is so subordinated as to produce a charming and restful effect, which is yet brought to a focus at important parts by the brilliant colours of enamel. Messrs. Bragg have also executed a large seal for the borough, embodying the arms already mentioned, and which have been specially designed by them in accordance with the rules of heraldry.

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Mr. Johnstone, a commercial traveller of the firm of Messrs. Lawson and Co., jewellers, Glasgow, was washed overboard from the Orkney mail boat, and drowned while the steamer was off Cantishead.

Considerable damage was recently done by fire to the premises of Mr. F. W. Fisher, watchmaker, High-street, Slough.

The celebrated diamond necklace which Ismail Pacha presented to the Empress Eugénie on the opening of the Suez Canal, and which was sold together with the rest of the French Crown jewels a few years ago, is now on show at a Madrid jeweller's. The price asked for it now is £15,000.

Our Letter from the Diamond Fields.

(By Vaalite.)

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ONE of the most talked of things that has happened lately is the discovery of a new diamond mine on Wessel's farm in Griqualand West, just beyond the famous Du Toit's Pan. I am very interested in this discovery, as I know the lessee very well, and have watched the gradual opening up of the district. Some time ago he showed me quite a number of diamonds which were of first-rate quality, and which he said he had found himself on the new site. But when one recalls to mind the numerous instances in which diamonds have been shown as coming from this or that "new mine," and that after the thing has been sifted, it has turned out a case of "salting," one is always a little suspicious. Be that as it may, I took the opportunity to accompany the lessee, and sure enough I saw him with another man take from the stuff diamonds similar to those I had seen before, and after watching a long time, I am prepared to say that they yield quite a carat to the load. Sometimes, of course, the yield might be less, but it would never be less than half a carat. Du Toit's Pan is the largest of the mines, being nearly as large as the other three principal ones put together; it is close to the celebrated Bultfontein—the others lay some little distance further N.W. But the appearance of this new mine and its yield call to mind more those of the remotest Kimberley mine. The mine, so far as is known, is about large enough for 800 claims. The most remarkable thing to me is that the De Beer's did not at first believe in it, for I hear it was offered at a certain price, and they let it slip. I have it on the best authority now that the lessee will not sell, and that he is determined to work it himself; but of course it simply means this, that the De Beer's will be obliged to buy it, if they wish to carry out their expressed policy of limiting the market, for already they have found it necessary to buy all the *débris* diamonds, which amount to something like 7,000 carats a week. Doubtless, when the permit was given to the unemployed to re-wash this *débris*, it was never for one moment expected that the industry would grow to the importance it has; and complications have arisen at which we must all feel not only sorry but sympathetic.

I sent you the history of how these *débris* washing originated, and described how, consequent upon the limiting of the output by the amalgamated De Beer's companies, a large number of men were thrown out of work. The paternal Government interposed, and after several conferences between the Government, the Town Council, the Diamond Washers' Association and the directors, it was ultimately agreed that a certain area should be set apart. Then came an investigation of the claims of the respective applicants, and it was thought that, by limiting their extension and allowing only apparently deserving cases to take up washings, any serious evils might be averted. However, the weekly output soon amounted to £3,000 or £4,000, and it has since reached over twice that amount, giving rise to the first difficulty the company foresaw. It was soon found that with all the care taken, "claims" had been wrongly distributed somehow; for, while in hundreds of instances deserving cases had been relieved, and industrious unemployed men had been able to keep the wolf from the door, many others had grown fat, and were saving fortunes at the rate of £200 and £300 per week, and were simply riding backwards and forwards to see the Kafir boys work. These washing leases were granted for a year only, but even that shows that great forethought is necessary in all these matters. No doubt Mr. Rhodes realises this now, as he has given notice that the leases will not be renewed. Other complications have necessarily arisen; for, as you might suppose, growing fat generally means growing saucy, and so these washers have formed themselves into a Protection Union, and have for a long time been holding meetings and making denunciations and resolutions. But, as might be expected amongst men of this class, no agreement can be arrived at, owing to this or that one's prejudices or spleen. What the "King of Organisation" will do when he gets back, and the policy he intends to adopt, remains to be seen.

When one realises how the De Beer's Company has got possession of the mines, it is very unfortunate to see that a large fall of reef and blue has just buried—probably for ever—the claim of the last individual digger in Du Toit's Pan. Turning to Kimberley Mine, we have some news of a rather important character, not that it has surprised everyone—nothing surprises some people. It is that of the results of the boring of the deep shaft outside the mine. You are doubtless aware that a diamond mine is something like a huge well, with a circumference of from one to three miles. I do not wish to imply that they are exactly round; Bultfontein is nearest a circle, the others are more kidney-shaped. If you imagine this unwalled well bringing up from unknown depths in the earth mud amongst which are diamonds scattered, until it has filled up the old well, you can realise something of its nature; always, however, bearing in mind the difference in size. Now, for sometime one could dig out the hardened mud with impunity, irrespective of the nature of the walls of the surrounding rock, but presently we should get beyond the angle of rest, and should have to cart away some of the surround reef, or it would collapse. Doubtless, we should be tempted to forget this, and get many "falls," as they have done here in all the mines, especially in this one. But by 1883, the top part of the mine had widened out to fully five times the width of the pipe, and now the old mine is choked full of fallen reef. Other methods of mining had to be resorted, and those of mining pure and simple! *Diamond digging* became a thing of the past; vertical shafts had to be sunk through the hard rock outside the pipe (our old well proper), and from these levels were driven in. A shaft was sunk in 1889, and called the Atkins shaft, 500 feet deep, some distance outside the mine, and a level worked from it. There is another shaft nearer the pipe than this, from which various levels are worked down to 845 feet. There are also two other shafts sunk at other times, to try the nature of the surrounding rock; but the great shaft of all is the one now in progress. What they passed through in this shaft is of immense interest, although a greater interest yet awaits the completion of that shaft. The first 30 feet cuts through the ordinary surface soil of the country, and is followed by 5 feet of red soil; this is followed in its turn by 16 feet of a fairly hard basaltic rock. Then comes about 200 feet of black friable carbonaceous shales, very prone to disintegration by the action of weathering. Then 155 of dense hard rocks, something like some visicular basalts, and other trap rocks that I remember seeing at home in Scotland, the visicles being now filled with agates of all sizes, and other minerals which vary somewhat at different depths. I regret that when the 845 feet level shaft was sunk, I did not give the attention to it I now do, as it would have been very interesting to have compared the rocks so close to the pipe with those obtained from the more distant new shaft. For it would at once have solved the question as to whether these diamond pipes were originally mud volcanoes, or whether they represent the throat of a volcano which was belching forth hot fiery molten rock matter, as in the latter case a number of secondary minerals would have been developed, *i.e.*, if parallels with similar conditions all over the world go for anything. These rocks are followed by quartzites, to which there appeared to be no bottom, but at 1,160 feet they have to-day passed through the quartzites, and have come upon something the significance of which I will describe in my next.

Transatlantic Jottings.

An Organ for Opticians.

WE are glad to greet the appearance in America of a new paper, *The Optician*, devoted, as its name would imply, entirely to optics. At present the publication is only small, but the subscription is of like dimensions, a half-dollar. The office is 90, Nassau-street, New York. Its contents include both theoretical and practical articles, and we think it has the promise of a good future. This reminds us that we must give at our very earliest opportunity some optical articles. We have a lot of material pressing upon us, and feel once a month is not sufficient to get through it all.

Misplaced Confidence.

A FEW features connected with the following important case may serve to throw a great deal of light upon "how they do things on the other side." A precocious lad of seventeen summers was employed by Messrs. Lewisohn and Co., of Maiden-lane (the New York Hatton Garden), as salesman, at 10dols. a week—an excellent wage for a boy of that age—but Master Duncan thought himself by no means a boy, and figured prominently as a member of Talmage's Church and secretary to a dramatic club and sundry other things. It is remarkable his employers did not regard him as a "bit too cute;" but, on the contrary, they seem to have had unlimited confidence in his youthful faithfulness. Usually he carried stock to the value of 6,000dols. or 7,000dols.; but two days before he left he took out 30,000dols. returning with 9,000 dols., purporting to have left the others on appro.; next day he took about 6,000dols. more, returning with 3,000 dols.; and next day with over another 6,000dols. He was to have returned at 3 o'clock the same day, u somehow he did not! He has managed to get clear away without a trace behind him. A search at the youth's lodgings showed that it was a cleverly worked thing; he removed his "all" without even his landlady knowing it.

American Celluloid.

WITH the increase of the price of ivory vast quantities of this substance have been employed as a substitute. There are several preparations that are sold under this heading. All the celluloid articles sold in the United States, and immense quantities of them that are sold in Europe, are the production of an American company's factory; their output last year being 1,500,000dols. Their process, which is different from that employed on this side, consists in soaking paper and treating it with nitric and sulphuric acids; the product is then washed and camphor is added. The mass is then ground. Colouring matter is now added and the mass is made into a paste with alcohol; it is then pressed between rollers. The finished mass is very plastic and may be molded and pressed into any desired shapes, drawn into tubes, etc.

Round the Watch Factories.

THE Elgin is still the largest factory in the world, employing 3,000 hands, nearly half of which are young women. They have been turning out movements at the rate of 2,000 per day.

The Waltham, however, is running pretty close up to this, second. It has now 2,800 hands. Although great alterations are being made in their line of production, the Waltham intend to give up case making entirely, in which department they are employing 125 hands less than this time last year. The Waltham Dial Company have made a reduction in the hours of labour, making their day nine hours with ten hours' pay. Oddly enough, they say it gives great satisfaction.

The well-known old Seth Thomas Company are running their watch department prosperously, employing 250 hands, and turning out 80 finished movements a day. No less than seventeen different watches are now made by them.

The Columbus Watch Company has increased its capital from 200,000dols. to 500,000dols. It is reported new sites are being looked for in Drayton and Cleveland—much to the horror of the people of Columbus, who are exercising every effort to retain them. They are very busy in all departments, and seem now pressed for room. If they build a new factory, it is to hold 1,000 hands.

The Treasury Department has decided that watch cases cannot be sent to Switzerland for fine ornamentation and returned, without paying duty on the entire value of the case. A Newark case maker sought to have the duty placed only on the cost of the labour put on them abroad. The ruling will naturally limit the amount of such work being sent abroad.

* * *

At the Marlborough-street Police-court, William Godfrey (65), watchmaker and jeweller, Barnsbury-park, Islington, has been remanded on the charge of stealing from 3, Heddon-street, two sets of studs, 40 scarf pins, 300 precious stones, and other property, of the value of £1,000, belonging to Mr. Abraham Norman, jeweller and dealer in gems. When apprehended a number of diamonds were found in the possession of the prisoner.

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

(Continued from page 176).

The Hexagonal System.

The Natural Forms of Phenacite.

THE last gem of any importance and value that we shall describe crystallising in this system is the little known, but nevertheless exquisitely beautiful gem, the Phenacite. When this was first found in the chrysoberyl mines of Perm, it deceived the finders, as they mistook it for quartz, hence its name, from *phenas* a deceiver. But although crystallising in the same system as quartz, and occasionally occurring in forms similar to those sometimes obtaining in some varieties of that mineral, its general habits are quite dissimilar from it; moreover, there are many characteristics that readily separate the two. In the first place we do not find those striations characteristic of quartz in phenacite, nor is the surface lustre of the crystal so high; but approximates to some pseudomorphous quartz, and at times it is a little waxey, and generally of a grey shade, tinged perhaps with a slight suspicion of blue or green. It further enjoys a very fair hue suite, including, though somewhat rarely, bright wine yellows, reds, and browns. It is probably one of, if not the brightest, of the gems. I remember seeing one, about two carats, come into the market some years ago, which was simply superb; the cutting, too, was very distinctive and remarkably effective. It was a somewhat modified "Antwerp" pattern. Not having this gem cut in this pattern in my collection, I tried to purchase it, but the price was prohibitive, and I had to let it pass. Some months afterwards I had the pleasure of recognising an old familiar face, mounted as a single stone ring, in one of the largest windows in the Trade, with the following four words attached, "Specimen Old Indian Diamond." I learnt the price asked for it was £200. I was also told that it was sold. I mention this circumstance as a tribute to beauties of the gem.

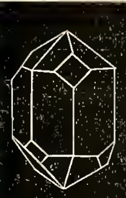


FIG. 22

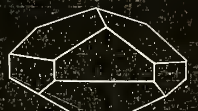


FIG. 23

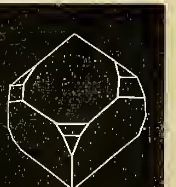


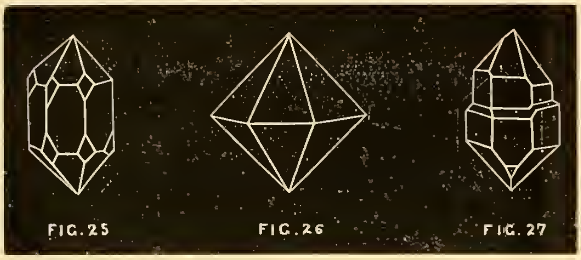
FIG. 24

Fig. 22 shows a form which is said to be common and characteristic; but, so far as my experience goes, such is not the case. We see it is a hexagonal prism, doubly terminated with a pyramid, the only complexity introduced being the little diamond-shaped faces on the solid angles of the prism and pyramid, doubly alternating, *i.e.*, alternating in the horizontal zone and in the vertical zone also; a feature we described in the last chapter as *hemimorphism*.

Fig. 23 is by far a more common form, indeed, they may be said to occur usually in such low obtuse rhombohedra; in this figure the three central horizontally disposed faces are the faces of the six-sided prism, their outline being due to the meeting of the two rhombohedral three faced pyramids that terminate the crystal top and bottom; sometimes low rhombohedra pure and simple occur without the interposition of prismatic faces.

Fig. 24 shows a case where the corners of a rhombohedron are replaced by two small facets; the upper ones are at such angles that if they were produced equally to the larger rhombohedral faces, the figure would be an ordinary hexagonal pyramid, and the same may be said of lower front one; these faces, then, connect this figure with the double hexagonal pyramid, while the two faces just above the median line, and the one below it, connect it with the hexagonal prism.

The Natural Forms of Quartz.



The claims of this family to rank as gems are insignificant, compared with the desirability of the knowledge of the forms in which it is found; for although the most plentifully distributed mineral in nature, nothing seems to be such a stumbling-block to all those whose desire it is to possess diamonds. If I were to analyse all cases of stones sent to me for determination, certainly ninety-nine out of every hundred would be quartz mistaken for diamonds. Men of nearly all trades and professions alike seem a victim to the glossy colourless little crystals. But the shape of any of the infinite variety of forms in which it occurs is altogether so dissimilar from diamonds, that when once their characteristics are pointed out mistake ought to be impossible. Firstly, its six-sided symmetry is totally dissimilar from the four-sided symmetry of the diamond; there are also certain features about the surface of quartz crystals generally that at once distinguish them, some faces being of quite a different lustre to others, and although this is not always obvious at a glance, a lens will generally reveal the fact; and, further, the prismatic faces are usually striated, sometimes irregularly, and at others close even and very firmly, at right angles to the direction of the prism.

The transparent varieties of this family include the rock crystal—clear limped and colourless—passing into browns and yellows, when they are known as cairngorms; the yellow also is sometimes called Scotch or false topaz, the purple amethyst, and numerous other minor varieties. The clear, colourless varieties occur either as prisms terminated singly or doubly with pyramids of all sizes, from mere specks to hundreds of pounds in weight, or attached.

Fig. 25 shows a prism terminated by two pyramids; sometimes the prisms are reduced to mere lines, or entirely wanting, as in Fig. 26; frequently thousands of crystals may be obtained from a river bed which contains the waste of rocks that have been denuded, the softer parts of the rock having been reduced to an unpulpable mud, whilst the crystals remain sound and perfect, with not even their edges destroyed. Occurring so plentifully in nature, it is only natural to expect to find a great variety in their shape; the first of these and the most general is caused by the over-development of some of the pyramidal faces; sometimes of one only, which almost obliterates the other five, perhaps quite, some of them. Sometimes half the planes are suppressed, giving rise to hemihedral forms; not only does this take place in the pyramidal faces, but in the prismatic faces too. Before me is a group of hemihedral amethyst crystals from Schemnitz, Hungary, all of which have but three faces to the pyramid; whilst in the prisms there is every degree of variation, by suppression of the alternating faces from an unequal six-sided prism to a three-sided one pure and simple. Another variation that frequently obtains, especially with amethysts, is shown in Fig. 27, where it looks as if one crystal had been put *into* another. Sometimes the edges of this first gallery, if I may so call it, are crowned by a row of pyramids, generally very much flattened, the colour being strongest in the apices of the pyramids. This figure also shows the irregularity of pyramidal faces that usually obtains. Sometimes the apparent caps are replaced by real ones, *en chemise*, as the French call them, which are quite detached.

In Fig. 25 we notice a number of little facets in a somewhat similar position to those in Fig. 22, but their shape is, when looked at closely, quite different; in the latter (22), we notice they are diamond shape or bilaterally symmetrical; in Fig. 25, on the other hand, they are one-sided; and looking at all the little facets along that zone we see them all pointing in the same direction; if we turn the crystal round, or, what is the same thing, turn the book round, we see they still turn in the same manner, forming a spiral as it were, from the left upwards, hence called left handed; if the spiral pass in the opposite direction they are known as right handed; these phenomena of right and left handedness are associated with some very interesting optical phenomena, about which we may speak on another occasion.

(To be continued.)

Dishonesty in the jewellery trade is of frequent occurrence; but seldom has so much leniency been shown as that which characterised a well-known firm on a recent occasion before Lord Mayor Savory. Arthur Cooper (22) was charged with stealing jewellery, the property of Messrs. W. Johnson and Son, jewellers, 54, Threadneedle-street. On stocktaking the prosecutors found some rings and other jewellery missing in the prisoner's department. Cooper, finding that suspicion was directed against him, gave himself up to the police. The prosecutors, in consideration of this being the prisoner's first offence, desired to avoid a conviction, and therefore offered no evidence. The Lord Mayor, in discharging the prisoner, hoped the proceedings would be a lesson to him. Had he been convicted he would very likely have been sentenced to penal servitude.

Birmingham Jewellers' and Silversmiths' Association.

THE third annual meeting of this association was held at the Assay Offices, Newhall-street (by permission of the Guardians). Mr. J. Millward Banks was unanimously elected to the chair. According to the report, the members now number 180, forty new members have been made during the year, and three members have resigned: Messrs. W. H. Sheldon, C. E. Solomon, and E. M. Evans. The committee recognised the assistance rendered them in their efforts to abolish the plate duty by the Right Hon. J. Chamberlain, M.P., and congratulated the trade on the relief which the abolition of the plate duty has given them. In dealing with the art classes the report made special mention of the services rendered in the equipment of the new technical school in Victoria-street by Messrs. P. H. Levi, C. Green, and R. H. Jones, together with the grant of £500 from the Assay Offices. In the fitting up of this school they have sought to make a model workshop, and one which will be of interest to a stranger entering the city as a technical school. The committee tendered their thanks to Mr. Mark Morton, of Buckingham-street, Birmingham, for his valuable gift of a pair of rolls, and to Messrs. Elkington and Co., Limited, Mr. B. J. Round, Mr. Fridlander, the Manufacturing Goldsmiths' and Silversmiths' Company of London, Mr. H. Davis, and the Operative Jewellers' Society for various gifts in prizes and appliances. Mr. H. Warwood had been appointed superintendent of the school, with Messrs. Joseph and Slater as teachers of enamelling and repoussé work. Mr. Joseph had, however, since retired, and Mr. Cope had been elected in his place. In compliance with a desire expressed by the officials of the City School, that an examiner should be appointed, whose special knowledge of the trade would assist the examiner of the City Schools in the awarding of certificates, Mr. J. W. Tonks had been unanimously chosen, and had kindly consented to act. The number of entries for the spring term of 1890 was 113, as against 98 for the spring term of 1889. The number of entries for the autumn term of 1890 was 252—viz., 240 students paying half fees; twelve paying full fees. The average attendance during the spring term was rather over 30, and for the autumn term about 165. The entries for the technical schools number 71, those entering being expected to attend at least two nights each week. The art classes appear to be making signal progress. A scheme has been drawn up for the Vigilance Committee of the association, and a special fund has been commenced to meet the expenses of the committee. A special feature of the work is that prosecutions are conducted by and on behalf of the association. Several successful prosecutions have been conducted during the past year, and sentences from five years' penal servitude downwards have been passed. They have now laid down the following rules:—I. That members shall at once, upon it coming to their knowledge, give information of theft, or receiving, and that they shall be prepared to carry any case to an issue. II. That on information being given to the officers of the association a meeting of the Vigilance Committee shall be called, and it shall be decided what proportion of the expenses—which shall in no instance exceed half—shall be borne by the association. The new Bankruptcy Bill was specially referred to the Emergency Committee. On two occasions they represented by circular their views to the Grand Committee on Trade, to whom the Bill had been referred. The committee have reason to believe that their views received the most careful attention of Parliament. The committee continue to take an active interest in the insolvencies affecting the trade, and it is satisfactory to know that their efforts in this direction appear to be every year more generally appreciated. Not only is this the case in Birmingham, but also in London and elsewhere, and this is evidenced by the fact that in no single instance where the association have actively supported an arrangement outside the Bankruptcy Act, has such arrangement failed to be carried. On the other hand, in several instances where an arrangement has been endeavoured to be carried without their active support, it has fallen through. Fortunately for the trade, the number of failures affecting its members during the past year has been comparatively small, and, with one exception, the cases have not been important. The balance-sheet was read by the secretary, and it shows that the association is in a very satisfactory condition. The Art and Technical Schools Fund shows a balance in hand of £280 17s. 2d., and the Prosecution Fund £100.

The Chairman, in moving the adoption of the report, thought they had good cause to congratulate themselves. During the three years of its existence their association had gone forward by leaps and bounds, and in the year just past they were able to point to four monuments of the trade which had been erected by their efforts. The first was the abolition of the duty on gold and silver plate. This had been accomplished by the combined efforts of the trade, who had represented to those in power the injurious effects of such an Act upon their trade; without combined action this duty would never have been repealed, and he looked upon this as a monument erected solely by the exertions of the Jewellers' Association. The next monument was the formation of the art and technical schools, which, but for the assistance of Mr. Green, he felt the trade would not have possessed, and now he was pleased to say they had another link connecting their trade with the art of the city in the appointment of Mr. J. W. Tonks as examiner. Referring to the work of the Vigilance Committee, this he characterised as another monumental work. For years they had been trying to form some organisation which would be able to deal effectually with cases such as the Vigilance Committee dealt with; but until the matter was taken in hand by their association they had been unable to find out any means of benefiting the trade in this direction. The other great and important monument was the formation of a fund for the prosecution of fraudulent debtors. This was another effort they had made to cleanse the trade, and by its operation the whole of the trade would be benefited. Mr. W. Best, in seconding the motion, corroborated the points taken up by the chairman. The motion was then put and carried.

The election of officers was then proceeded with, Mr. J. M. Banks (the chairman) nominating Mr. Walter Best for the chairmanship, and having been duly seconded, Mr. Best's name was put to the meeting, and he was unanimously elected. Mr. Banks having vacated the chair, the newly-elected chairman returned thanks. Mr. W. H. Small nominated, Mr. Nathan seconded, Mr. Joseph Wainwright as vice-chairman. Mr. McEwan proposed, and Mr. Walter Ginder seconded, the appointment of Mr. R. H. Wright as treasurer, which was carried. Mr. Wright proposed, and Mr. P. H. Levi seconded, the re-election of Mr. J. W. Tonks as honorary secretary. Mr. Jenner proposed, and Mr. Reading seconded, the appointment of Mr. W. H. Small as auditor, which was carried. The following gentlemen were elected to serve on the committee:—Messrs. C. Green, J. M. Banks, J. Goode, Jones, and Pendleton. Mr. Green then moved a hearty vote of thanks to the retiring officers, and in doing so spoke in flattering terms of their late chairman (Mr. Banks), and also of the other officers and members of the committee. Mr. B. H. Joseph, as seconder of this motion, said he was astonished at the amount of work done by the officers of the association, and was sure their time and attention had been taxed very much to accomplish what they had done.

The motion on being put was carried, and Mr. Banks briefly returned thanks on behalf of the retiring officers. A vote of thanks having been accorded to the wardens of the Assay Offices for the use of the meeting-room, the proceedings were brought to a close.

Banquet of the Association.

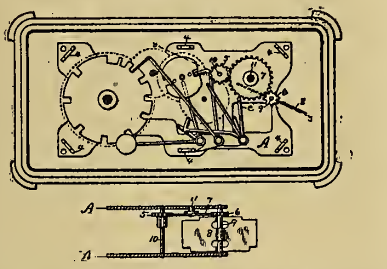
THE third annual dinner of the association was held at the Great Western Hotel; Mr. Walter Best presided, and there were also present the Right Hon. J. Chamberlain. M.P., Sir Philip Magnus (of the City and Guilds of London Institute), Mr. Jesse Collings, M.P., Mr. W. Kenrick, M.P., Mr. J. Powell Williams, M.P., Mr. Joseph Wainwright, Alderman Pollack, Councillors Jacobs, C. Green, Bradley, and Allen; Messrs. E. R. Taylor, J. W. Tonks (hon. secretary), James Grant (president of the Operative Jewellers' Society), H. R. Wright (hon. treasurer), J. Bragg, W. H. Small, C. B. Bragg, Luke J. Sharp, Whitworth Wallis, Auguste Willms, W. J. Wainwright, W. A. Addinsell, Allen Edwards, S. J. Porter, and almost all the members of the local trade. Mr. Chamberlain gave the toast of the "Birmingham Jewellers' and Silversmiths' Association," and did so in the fullest confidence, for the reputation and influence which that body had already attained would be confirmed and strengthened in ensuing years. He dilated in humorous terms upon the fact that the association had passed through its experimental stage, and said the chief aim had been to raise the character of their manufacture—(hear, hear)—to create a higher standard of taste—(hear, hear)—both in employers and in employed—(hear, hear)—and to afford the means of education which are required in order to secure these results. (Hear, hear.) That had been their principal object; that was the object to which they had given most of their money and most of their time, and already had made very great progress. Some time ago—last year it was, when on the occasion of the last dinner—he ventured to express the hope that by their efforts they would introduce into the trade the conditions which account for the superiority of many articles of foreign and of ancient manufacture, he found himself the subject of rather severe criticism in some of the London newspapers for this apparently very innocent remark. He thought it was a very modest hope, but he was told that he had altogether mistaken the conditions of the problem; that, as a matter of fact, the taste in manufactures was dictated by the purchaser and not by the manufacturer, and that all the beautiful objects of art in jewellery and in goldsmiths' and silversmiths' work which we admire in our museums and collections were made to suit the refined and limited taste of kings and nobles; and that as nowadays we cater for the populace, we could hardly expect to do anything but continue in the track in which Birmingham has been for so many years, the manufacture of what is cheap and tawdry. He was always ready to profit by criticism, and he would admit that there was some truth in this statement. (Laughter.) But it was not a conclusive argument. It was quite true that the great works which remained the standard works in the trade, the historical articles of jewellery and goldsmiths' ware, were made for wealthy patrons, to whom cost was no object at all. And it was quite true that popular art must be cheap. But he would utterly deny that it need be tawdry—(hear, hear)—and he believed that they might reasonably hope to educate the taste of the purchaser as well as the taste of the employer and the workman. And if he wanted any illustration, any example of that, he should find it in the experience of those Oriental nations—especially a nation like Japan—which, at all events until very recent times, when they had been perverted by European example—(hear, hear)—have been accustomed to give even to the commonest articles and the necessaries of ordinary life a taste in form, a harmony of colour, and a skill in design which would do credit even to the most expensive productions. (Hear, hear.) He said, then, whatever might be the result of the experiment which the association was trying, at all events it was a great experiment, a worthy experiment, and one to which we should all be glad to wish success. (Hear, hear.) As regards the other, and what he might call the more commercial objects of the association, he hoped he might be allowed to congratulate them on the fact that they had been at last relieved from the special burden which pressed upon this great industry. (Cheers.) He rejoiced that the duties on plate had been finally abolished. (Applause.) Councillor C. Green responded to the toast. Mr. J. M. Banks proposed "Our City and its Industries," which was acknowledged by Mr. Jesse Collings, M.P., and Mr. Powell Williams, M.P. Mr. J. W. Tonks gave the toast of "Art and Technical Education." Alderman Kenrick, M.P., responded, and was followed by Sir Philip Magnus, who was deeply interested in the valuable and useful experiment the Jewellers' Association was making. It was no small thing to find two or three hundred boys, all apprentices, coming to that school to learn the art which underlay their industry. He believed that a school so conducted would be a great success, and that their industry would be improved by it. (Applause.) They were often reminded that the workmen of this country were sadly deficient in artistic skill. It was a well-known fact that only a few years ago nearly every industry in this country obtained its designs from French artists; but it was very satisfactory to know that, owing mainly to the good work of the art schools established throughout the length and breadth of the land, there was now scarcely a single industry which found it necessary to look to France for its designs. (Hear, hear.) He thoroughly believed that English workmen had the same art aptitude and the same power of applying that art to the work in which they were engaged as French workmen have. All that was necessary was that they should be given the same surroundings and should have the same opportunities of training. If drawing were taught in the elementary schools as it was now, and if they beautified the city and adorned their streets, decorated the walls of the rooms in which the children were educated, and afterwards gave them the opportunities of art and technical education which they enjoyed in Birmingham, they would train up a body of workmen who would be as good designers as any that could be found in France and other countries. Then the millions of money which we still expended in importing fancy articles stamped with beauteous design and taste from France might be expended among our own workpeople, and every art and industry would flourish in our midst. (Applause.) "Our Guests" was proposed by the Chairman, and responded to by Mr. E. R. Taylor. The concluding toast was the health of the Chairman.

Edinburgh and Glasgow jewellers have recently been honoured with sundry visits from members of the light-fingered fraternity. Two men were watched, and an arrest effected; they gave the names of Arthur Phillips and John Shine, both representing that they came from London. The men were followed from Edinburgh, and went to the shop of Mr. Lizar, optician, Glasgow, where one purchased a pair of gold-framed eyeglasses, whilst his companion purloined a second pair. Prisoners, who were characterised as practised thieves, were committed for sixty days each.

Illustrated Inventions Record.

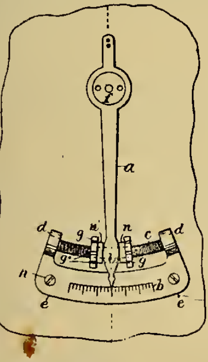
Clock Striking Mechanism.—Almeron M. Lane, Meriden, Conn.

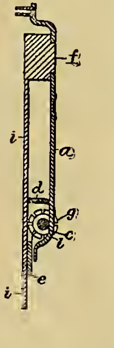
A clock striking-train having an idle-wheel 7 interposed between the pinion of the fly or fan-shaft and the wheel which drives the pinion.



Watch-Regulator.—Charles Nobs, Newark, N.J.

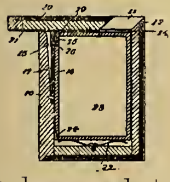
In a watch-regulator, the combination, with the regulator-lever, of the screw arranged transversely thereto, and the nuts fitted to the screw and arranged to press upon the opposite sides of the lever.





In a watch-regulator, the combination, with the regulator-lever, of the screw curved concentric with the lever-fulcrum, and the nuts fitted to the screw upon the opposite sides of the lever and provided with collars for turning the same.

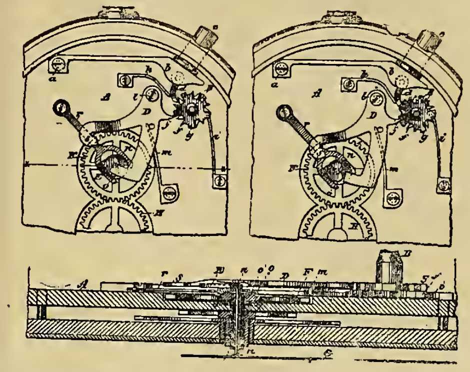
Jewel-Case.—Hinrich Grohbrugge, New York, N.Y.



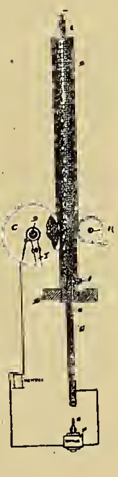
As an improved article of manufacture, a jewel-case consisting of a box-like casing open at one end only and provided with a spring at the bottom of its inner chamber, a latch located in one side wall of the body-chamber, a drawer adapted to enter the chamber and engage with the spring and latch, and a cover adapted to close the open end of the box-body.

Stop-Watch.—Edmond Kuhn, Brooklyn, assignor to the Manhattan Watch Company, New York, N.Y.

The longitudinally-movable spindle *n*, carrying the sweep second-hand G, the clutch-section *q*, and heart-cam E, combined with the spring *r*, driving-wheel F, having clutch-section *o*', and with the claw-shaped lever D, one arm of the lever being adapted to depress the spindle *n*, and the other arm *s* bent out of plane with the first arm and adapted to bear against the edge of the heart-cam, and with means for actuating the lever D.



Clock-winding Mechanism.—Willard N. Packer and William W. Bradley, Canton, Ohio.



1.—In clock mechanism, an exteriorly-threaded weighted screw supported in a perpendicular position and a gear-wheel in the said mechanism actuated by said screw.

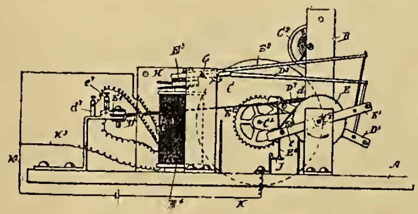
2.—A weighted tube provided with a thread on its surface, a gear-wheel actuated by said tube, and power mechanism connected with the tube to turn and raise the same.

3.—The combination of a worm-gear and a weighted screw for maintaining uniform tension or pressure on the mechanism connected with the gear.

4.—The weighted tube and a rotatable shaft on which the tube is free to gravitate without turning, a wheel actuated by the tube, and mechanism to rotate the shaft and raise the tube.

Independent Electric Clock.—Edouard Lefebvre, Montreal, Canada.

An electric clock, the combination, with the driving-arbor in gear with the usual clock-work mechanism intervening between it and the index-arbor, of electro-magnets and armatures, the latter extended in length and pivoted at a point which will place a preponderance of weight on one side and furnish sufficient surface for attraction by such magnets on the other, a battery, and make-and-break mechanism operated from said arbor for passing the current from such battery alternately through different magnets to elevate the heavier ends of the armatures, and connections between these latter and the arbor, whereby upon their being released they will drop and rotate such arbor.



APPLICATIONS FOR LETTERS PATENT.

This List has been specially compiled for the Watchmaker, Jeweller and Silversmith *by* Messrs. W. P. Thompson and Boult, of 323, High Holborn, London, W.C.; 6, Lord-street, Liverpool; 6, Bank-street, Manchester; and 63, Long-row West, Nottingham.)

940.—Edward Attenborough, London, for "Improvements in or relating to jewellery." Dated 19th January, 1891.

985.—John McConnell, Ballymena, co. Antrim, for "Improvements in timepieces of all sorts" (complete specification). Dated 20th January, 1891.

996.—George Edward Benton and Charles William McAnulty, Birmingham, for "Improvements in brooches, lockets and pendants." Dated 20th January, 1891.

1,048.—William Hazlitt, London, for "Improvements in fancy pencil cases, and similar articles." Dated 20th January, 1891.

1,144.—James Dixon, London, for "The improvment of keyless or other watches." Dated 21st January, 1891.

1,202.—Marcus Devrees, London, for "Improvements in electric clocks." Dated 22nd January, 1891.

1,284.—Edmund Edwards, London (a communication from Theodor Lange, of Germany), for "An improved method of setting diamonds in steel for tools." Dated 23rd January, 1891.

1,339.—Ernest De Pass, London (a communication from Heinrich Christian Spohr, Germany), for "Improvements in alternating current electric clocks." Dated 24th January, 1891.

1,434.—William Hazlitt, London, for "Improvements in fancy pencil-cases." Dated 27th January, 1891.

1,441.—Edward Tranter, of Newcastle-on-Tyne, for "Cleaning silver and silver-plated articles and the like." Dated 27th January, 1891.

1,552.—Arnold Haseler, London, for "Improvements in brooches." Dated 28th January, 1891.

1,608.—George Roden, Birmingham, for "An attachment for securing the pins or prongs of brooches and other ornaments." Dated 29th January, 1891.

1,708.—John Wycliffe Longstaff, Durham, for "A link for fastening cuffs." Dated 30th January, 1891.

1,729.—Henry Smith Prentiss, London, for "Improvements in clock pendulums." Dated 30th January, 1891.

1,730.—Henry Smith Prentiss, London, for "Improvements in clock cases." Dated 30th January, 1891.

2,035.—Nathan Silberberg, London, for "Improved winding mechanism for watches." Dated 4th February, 1891.

2,037.—George Fraser, London, for "Improvements in mills or machines for grinding and amalgamating gold, silver, and other ores or hard substances." Dated 4th February, 1891.

2,114.—Thomas Earnshaw, Birmingham, for "Improvements in compensation balance wheels for watches and other mechanism." Dated 5th February, 1891.

2,250.—Arnold Haseler, Birmingham, for "An improvement in the fastening of brooches or other articles of jewellery." Dated 7th February, 1891.

2,328.—Edwin Jarman, Cardiff, for "A new and improved mixture or composition for cleaning and polishing gold, silver, and other metals, tin, brass, and all kinds of plated and metal goods and effects, and jewellery of every description." Dated 9th February, 1891.

2,346.—Nathan Silberberg, London, for "A keyless winder and pointer adjusting mechanism for watches with fusee wheels, having a disengaging device, operated automatically when the watch is wound up." Dated 9th February, 1891.

2,347.—John Henry Montague, London, for "An instrument for clearing out key barrels." Dated 9th February, 1891.

2,474.—Francis William Engelbach, London, for "Improvements in watches and other timepieces, by which they can be readily used for compasses." Dated 11th February, 1891.

2,561.—Isabella Annie Cawley, Brighton, the protection of watches, purses, and money, styled "The Naval and Military watch and pocket protector." Dated 12th February, 1891.

Gazette.

Deeds of Arrangement.

Hateley, Henry, 27, Lower Hall-lane, and Birmingham-road, Walsall, brass founder, silver plater, and harness furniture manfuacturer. Trustee: William E. Tompkins, Bridge-street, Walsall, accountant, with a committee of inspection. Filed February 7; secured creditors, £350; unsecured liabilities, £1,091 2s. 10d.; assets, £206 12s. 4d.

Myers, Barnett, 45, Frederick-street, Birmingham, and at Johannesburg, under the style of Myers Bros., and at Durban, S.A., merchant and jeweller, lately trading in copartnership with Michael Myers and Michael Henry Emanuel (which partnership was dissolved on July 3, 1890). Trustee: Allen Edwards, Birmingham, C.A. Composition to English Creditors of 10s. in the £, payable 2s. 6d. forthwith, and balance by three equal instalments, at four, eight, and twelve months from date of first payment, the last instalment to be secured by a surety. Filed January 4, pursuant to section 5. Unsecured liabilities, £19,140 6s. 2d.

Powell, Samuel James, 6, Winchcomb-street, Cheltenham, Watchmaker and jeweller. Trustee: George G. Poppleton, 26, Corporation-street, Birmingham, C.A. Unsecured liabilities, £569 3s. 8d.; assets, £500.—*Creditors:—*

		£	s.	d.
Raphael, J., and Co.	London	16	11	3
Williamson, H.	,,	27	5	2
Barnett, B.	Birmingham	19	13	4
Bowen, G., and Sons	,,	10	10	0
Collett and Co.	,,	213	6	3
Harris and Sheldon	,,	14	3	4
Unna, J. A.	,,	27	0	11
Margrett, H. G.	Cheltenham	50	0	0
Powell, Samnel Dixon	,,	50	0	0

Barrett, Arthur, 23, Russell-street, Landport, optician and watchmaker. Filed February 21. Unsecured liabilities, £450 11s. Composition of 5s. in the £, payable forthwith.—*Creditors:—*

		£	s.	d.
Ahronsberg, Bros.	Birmingham	18	0	0
Barrett, E.	Landport	124	11	0
Bernstein, —	London	15	0	0
Dimier, Bros.	,,	54	0	0
Harper, T. A.	Birmingham	39	18	7
Hollanders, E.	Southsea	11	7	0
Horwitz and Co.	London	13	6	6
Pratt and Son	,,	12	3	2
Simpson, S. J.	,,	70	0	0
Willis, —	Birmingham	24	0	0

Turner and Darby (Charles Monuox Turner, trading as), 26, Regent-place, Birmingham, and 277, Hagley-road, Edgbaston, Birmingham, jeweller. Trustee: James Rhodes, 10, Newhall-street, Birmingham, C.A. Filed January 3. Unsecured liabilities, £1,731 19s. 9d.; assets, £1,200.—*Creditors:—*

		£	s.	d.
Backes and Strauss	London	378	0	0
Ochs Bros.	,,	55	6	6
Bushell, Charles	Birmingham	32	6	0
Banks, T.	,,	37	10	0
Clay, John	,,	11	0	0
Chavasse, —	,,	17	0	0
Chesshire and Gibson	,,	36	0	0
District and Counties Bank	,,	470	0	0
Hilton, William Henry	,,	20	0	0
Kemp, A., and Son	,,	46	9	0
Randall, J.	,,	109	7	2
Round, B. J.	,,	76	10	0
Sanders, John	,,	13	12	0
Taylor, —	,,	33	0	0
Walker, Joseph	,,	65	17	0
Westwood, C., and Son	,,	200	0	0
Webster, —	,,	12	0	0

Bills of Sale.

Bicknell, Stephen, 29, Belle Vue-gardens, Brocklebank-road, Wandsworth, photographic apparatus manufacturer's manager and optician. In favour of London and Westminster Loan Company. Filed December 30. £30.

Wilson, Morris, 37, Brondesbury-road, Kilburn, diamond merchant. In favour of Lewis Raphael. Filed December 16. Settlement in trust for wife.

Satisfactions.

Gammage, Thomas Douglas, 25, Clifden-road, Median-road, Lower Clapton, watch and clock manufacturer. In favour of London and Westminster Loan Company. Filed January 30. £30.

Green, Henry George (trading as C. Green and Son), 19, President-street, Clerkenwell, watch case manufacturer, engraver, and repairer; and Annie Green, his wife (trading as Madame Lena), same address, milliner and dressmaker. In favour of Charing Cross Bank. Filed February 13. £60.

Hitchin, William Henry, 13, Rotherfield-street, Essex-road, Islington, jeweller. In favour of Charles G. Lodge. Filed January 26. £30.

Power, John Watson, 16, Oxford-road, New North-road, Islington, manufacturing silversmith. In favour of Charles G. Lodge. Filed February 7. £30.

Simons, Joseph (sometimes known as Simmons), and wife, 11, Charles-street, Knightsbridge, dealer in jewellery, and letter of apartments. In favour of Consolidated Company, Limited. Filed February 9. £30.

Zimmer, Johann Wilhelm Carl (and wife), 20, Church-street, Soho, dealer in jewellery, and letter of apartments. In favour of Consolidated Company, Limited. Filed February 4. £30.

Pailthorpe, George William, 12, Northgate, Sleaford, watchmaker and jeweller. In favour of Wm. E. F. Brown and others. Filed May 10, 1888. £80. Satisfied December 16, 1890.

Payton, Francis William, 2, Vyse-street, Birmingham, and The Woodlands, Park-avenue, Soho-hill, Handsworth, jewellery manufacturer. In favour of Henry Payton, Filed June 11, 1888. £387. Satisfied February 5, 1891.

Dissolutions of Partnership.

Kettle, Edgar and Thomas Messenger, 32 Great Portland-street, Oxford-street, manufacturing jewellers. December 31, 1890.

Notices to Creditors.

Baxter, Sydney, 47, Fleet-street, and 25, Wellington-street, New Swindon, jeweller and outfitter. Trustee: H. W. Bowles, 41, Broad-street, Bath—released December 29, 1890.

Pearce, James, 23, Whitefriargate, Hull, jeweller. Trustee: G. G. Poppleton, 26, Corporation-street, Birmingham, C.A. —appointed February 4.

Whitehouse, Thomas, 5, Esplanade-gardens, South-cliff, and 1, Market-street, Scarborough, lodging-house keeper, silversmith, and working jeweller. Trustee: Official Receiver, Scarborough—released December 15, 1890.

Public Examinations.

At the Hull Bankruptcy Court, James Pearce, jeweller, came up for public examination. Mr. G. A. Wray represented a large creditor. The debtor stated that he carried on business in Whitefriargate, Hull, twenty years ago with capital. His brother supplied him with £1,000 worth of goods, and he started on credit. As a matter of fact, he had borrowed several sums of money which he put into the business. His liabilities at the present time for borrowed money were about £2,000. The amount he owed in unsecured creditors was £5,630 2s. 7d.; his free assets £2,617 8s. 3d.; leaving a deficiency of £3,012 14s. 4d. The amount of his turn-over was about £3,000 a year, and his gross profits from £800 to £1,000. Having been questioned as to some mortgages given on house and land for money lent, he was not aware that he had not sufficient money or assets to pay his liabilities until the time of filing his petition. The particular reason he had for knowing it then was on account of three bills for £500, which he was sued for by the holders. On the advice of his solicitor, whom he consulted, he filed his petition. Judgment had been signed against him on these bills. The examination was adjourned for a month.

George Henry Howard, of Stratford-on-Avon and Rugby, jeweller, was publicly examined in the Coventry Bankruptcy Court. The debtor stated that he commenced business at Stratford-on-Avon about 1882, and continued in the business till about a year ago. In 1888 he filed a petition in bankruptcy, and paid a composition of 5s. in the £. Twelve months ago he gave the whole of his estate to one set of creditors, leaving creditors to the amount of about £200 in the cold. He had also been a theatrical manager. The examination was adjourned.

Claude Robinson, jeweller, appeared in the Scarborough Bankruptcy Court to pass his examination. The liabilities of the debtor are £198 0s. 11d., and assets £113 16s. The debtor attributed the cause of failure to lack of capital and his father's opposition. The examination was adjourned.

Charles Paul, who formerly traded as Armstrong and Company, as a dealer in jewellery, was publicly examined at the Warrington Bankruptcy Court. The examination was adjourned.

Meetings of Creditors.

A meeting of the creditors of James Pearce, of 23, Whitefriargate, Kingston-upon-Hull, jeweller, was held at the Official Receiver's office in Birmingham. Mr. J. H. Scott, the Assistant Official Receiver, presided on behalf of the Official Receiver of Hull, and a large number of creditors were present or represented. The statement of affairs showed liabilities unsecured, £5,178 17s. 7d.; partly secured creditors expected to rank for dividend, £451 5s., making the total liabilities £5,630 2s. 7d.; and the assets, consisting of stock-in-trade, fixtures and fittings, furniture, insurance policies and book debts, were estimated to produce £2,638 7s. 8d. The debtor stated that his failure was due to having purchased land which he had been unable to sell, to losses he had sustained through the purchase of two houses in Hull, to loss on shares in the Hull and Barnsley Railway Company, to bad debts, and to legal proceedings taken against him for payment of £500 on certain acceptances upon which the debtor contended he was not liable, having regard to the circumstances under which the acceptances were given. The debtor had no offers to make to the meeting, and after some discussion it was decided to appoint Mr. G. G. Poppleton (of the firm of Messrs. Poppleton and Appleby, chartered accountants, Birmingham and Huddersfield), general manager of the Wholesale Trade Association, 26, Corporation-street, Birmingham, as trustee, with a committee of inspection, consisting of three of the largest trade creditors.

Applications for Discharge.

Joseph Myers, formerly carrying on business as a wholesale optician and jeweller, at 14, Duke-street, Aldgate, applied for his discharge in bankruptcy on February 13th. The debts were scheduled at £2,549 4s. 1d., and assets at £797 9s. 4d. Mr. E. L. Hough attended as Official Receiver, and Mr. Hasluck as trustee; Mr. W. H. Dale represented the debtor. It appeared from the Official Receiver's report that the assets are likely to realise £867 5s. 6d., that a dividend of 4s. in the £ has been paid, and that a further dividend of 1s. or 2s. in the £ may be declared. The bankrupt in June, 1887, having previously been for upwards of sixteen years in the employ of a firm of wholesale jewellers, commenced on his own account practically without capital. He attributed his failure to bad debts and insufficient trade. The Official Receiver opposed on the grounds that the bankrupt had traded after he knew that he was insolvent, and had given an undue preference to a creditor under the following circumstances: On April 1st, 1889, the bankrupt gave to a cash creditor goods to the value of £102 or thereabouts, and debited the creditor with that amount. There was no present consideration for the delivery of the goods. They have since been returned, and realised for the benefit of the creditors. Mr. Hasluck stated that the bankrupt had assisted him materially in the realisation of the estate. Mr. Dale having been heard on the bankrupt's behalf, his Honour proceeded to give judgment, and said that it was clear that the bankrupt was insolvent when he gave the undue preference to the creditor, and it was undisputed that he had traded after he knew that he was insolvent. Upon these two grounds, but taking into consideration what the trustee had said, the discharge would be suspended for two years from June 6th last, the date of the conclusion of the public examination.

An application for an order of discharge was made in the London Bankruptcy Court by Henry Fileman, pawnbroker and jeweller. From the report of the Official Receiver it would appear that the brankrupt commenced business about 25 years ago, with a capital of between £300 and £400, and he had since traded in Hornsey-road and at other addresses in London, and also at Northfleet. The receiving order was made on May 10, 1890, and bankrupt attributed his insolvency to his expenditure, including interest on borrowed money, having been in excess of his profits, and to depreciation in the value of his stock and effects as estimated for realisation. His liabilities were returned in the statement of affairs at £2,669, and it appears that the assets had realised £663. The Official Receiver opposed the application by reason of the bankrupt having omitted to keep proper books, and creditors also opposed on further grounds. Mr. Registrar Giffard, in the course of his judgment, said that this was the worst case which had ever come before him. He found that the bankrupt had been guilty of misconduct in obtaining goods on credit and sending them to his son, and his system of keeping his accounts was outrageously slovenly. He had also been guilty of fraudulent breach of trust and of fraudulent transfer of property; and, in order to conceal the latter, he had produced false receipts. The application must be wholly refused. Upon the application of Mr. Woolf, Q.C., his Honour directed the costs of the opposing creditors of and incident to the public examination and opposing the application for discharge, including the costs of shorthand notes, to be taxed as between solicitor and client, and paid out of the estate.

AT the Truro Bankruptcy Court, David Christopher Ingram, jeweller, Penzance, applied for his discharge. Debtor was originally a working jeweller, and gave bills to travelling traders for a considerable stock of goods. When the acceptances became due debtor renewed them at a ruinous rate of interest, with the result that he ultimately found himself in the Bankruptcy Court. The discharge was granted, subject to four months' suspension.

ANSWERS TO CORRESPONDENTS.

ANTI-GALLICAN asks how orchids and such-like delicate things are reproduced so faithfully in the lovely jewels he has just seen in the French capital. The exactness of these productions would at once suggest that they are not the production of the brain of the draughtsman; it is a work chiefly for the modeller, who first of all obtains a perfect specimen of the flower, he then makes a model of it in *pure* silver, which from its softness is easily worked, and not too expensive. The model once obtained, a gold one is made exactly like it; the silver being too soft for wear, and unsuited for enamelling. The colouring, on the other hand, is the work of the draughtsman, who sometimes draws the flower and fills in the colour on paper, or at others colours the silver model.

AURUM asks which is the richest gold mine in the world? We should unhesitatingly say Mount Morgan, New South Wales, as a mine. The gold occurs there in a remarkably rich ferruginous mass, not found in any other part of the world. If you were to ask an American the question he would doubtless tell you that Senator Hearst, near Deadwood, S.D., owns the richest. Here he employs three thousand miners, with an output of £40,000 a month.

"DOUBTFUL" says: "I have just read in the largest American journal devoted to our trade interests that 'there is no test for pearls, except the sight based upon experience. Is this the case?'" Certainly not! There are numerous tests. Artificial pearls are thin glass spheres lined with a glossy preparation made from the scales of the little freshwater *bleak* (*Leuciscus alburnus*), and partially or wholly filled with wax. The surface, therefore, of imitations is harder by far than the real. A slight application of the edge of a knife will immediately reveal this. Moreover, if there is an *orient* on the pearl, it exists on its *outer* extremity, and is the result of its mode of origin, and if it be pressed upon good black sealing-wax in a good condition of plasticity, the wax will afterwards show the same "colouring." But perhaps the simplest way is to take the least drop of acid—vinegar will do, or the juice of a lemon—and drop it on the specimen; if it be a true pearl (carbonate of lime) it will effervesce, but if it be glass no change occurs, but the acid will stand upon its surface like water. Great care must be exercised in using the knife, as a pearl is really very soft and easily damaged.

To the Editor of THE WATCHMAKER, JEWELLER AND SILVERSMITH.

DEAR SIR,—No doubt your readers will be anxiously waiting to hear the opinions of the other jewellers on the plate license question. Manufacturing jewellers are in favour of abolishing the license altogether, so as to ensure a larger outlet for their goods, as then every shopkeeper can sell watches and jewellery; and of course for a year or two the trade will be better. From the great number of letters I have received from all parts of the country, it would seem that retail jewellers are just waking up to the fact that if they want to save their trade from destruction they must stir themselves, and make the Inland Revenue officers in their own town and at Somerset House do their duty and look up these outsiders sharp. In my opinion everyone who deals in gold and silver, *of any weight whatever*, should be compelled to pay their full license of £5 15s. I shall be glad to hear the opinions of other jewellers on this very important question.—Yours faithfully,

A. SYDENHAM,
Wholesale and manufacturing jeweller.
26, Frederick-street, Birmingham.

To the Editor of THE WATCHMAKER, JEWELLER AND SILVERSMITH.

SIR,—Your remarks on the subject of the plate license deserve endorsement by all jewellers in the country. It would be perfectly ridiculous to do away with this slight safeguard against the invasion of our business by jacks-of-all-trades. It might be still better for our trade if the license were doubled, and no one allowed to sell any article, made wholly or in part of gold or silver, without having a license. This really ought to be done, and I sincerely hope that an Act to this effect may be passed in the near future. Who will take the matter up? I shall be glad to assist by doing what is possible in my own district. Hall-marking, too, ought never to be abolished.—Yours faithfully,

J. SIMPSON YEATES,
Watchmaker and jeweller.
7, Devonshire-street, Penrith,
Feb. 7th, 1891.

To the Editor of THE WATCHMAKER, JEWELLER AND SILVERSMITH.

SIR,—In your report of Mr. James Kendal's lecture on "the Equation of Time," I notice that the speaker claims John Harrison's apprentice, Larcum Kendall, as ancestor. I have recently had several of Kendall's chronometers to examine and clean. These were made between the years 1770 and 1776, and on them the name is spelt with two "l's." I think it would be interesting if Mr. Kendal would give the connecting links between that renowned horologist and himself. The literature of the period is confusing, some authors using one "l" and others two, but it may be safely assumed that Larcum Kendall himself knew how his name should be spelt.—I am, etc.,

JAMES U. POOLE.
33, Spencer-street, E.C.

MESSRS. C. TIMINGS AND SON have brought out a new patent combination match box and cigar cutter, a neat and well-finished article of considerable utility. It is made of the renowned "Aftcan silver," a thoroughly pure white metal, so that the article will always wear clean and retain its silver-like appearance.

The
Watchmaker, Jeweller
and Silversmith.

Entered at Stationers' Hall.]
[*Registered for Transmission Abroad.*

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APR 13 1891
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Vol. XVI.—No. 10.] APRIL 1, 1891. [Subscription, 5s. per Annum. } Post Free. Single Copies, 6d.

The Discrimination of Gems.

AMONGST the matter crowded out of our last number was a very curious case heard at the Clerkenwell County Court, in which Sigmund F. Tuteur, of Holborn-viaduct, sued a Hatton-garden dealer for £50, money paid, and damages through misrepresentation. It appears that in June last defendant represented to the plaintiff that he had a very fine white sapphire, which he offered to sell to plaintiff, remarking that there was an opportunity to make a lot of money over it. As the plaintiff did not feel disposed to buy it outright, he agreed to take the sapphire on approbation. The stone was handed to him in a paper marked, "One white specimen sapphire 43½ carats," which defendant guaranteed to be such, and ultimately agreed to sell it to plaintiff for £15. When the plaintiff was subsequently showing the stone to a customer it dropped and chipped, which necessitated re-cutting. For this the defendant charged £1. Plaintiff afterwards agreed to sell the stone to Ben Nathan, the actor, for £40. But Mr. Nathan, discovering it was not a sapphire, returned it. Defendant produced the cutter's receipt for re-cutting the stone, in which it was described as a white sapphire. Upon defendant asking plaintiff to return the receipt he refused to do so, upon which defendant pushed him against the mantelpiece, made a dash at his desk, and grasped a handful of papers, amongst which was the cutter's receipt. A clerk coming to the rescue seized hold of the paper, and it was torn in two. A policeman was sent for, who took the other part from the defendant's hand. It is very strange why he should have been so persistent in trying to obtain forcible possession of the receipt if it were *bonâ fide*.

Mr. Thomas Evans, well known to many of our readers, deposed that he had been twenty years in business. The stone was brought to him, and he formed an opinion at once. It was a topaz, worth probably about £2. It was not a sapphire, as he cut it with one, showing its inferior hardness; it was possible to scratch one sapphire with another, but not to cut it. He would stake his reputation upon what he had said.—Robert North, stone cutter, gave corroborative evidence.—Mr. William Ford, of Messrs. Ford and Wright, the first lapidary of the day, also affirmed it was only a topaz, of which they had some 50,000 in stock, specimens of which he exhibited. He had tried the stone upon two mills, and it certainly was not a white sapphire. The evidence thus put in was the first of the day; all witnesses unhesitatingly affirmed it to be a white topaz, or *Nova Mina*, as the Brazilians call them. But in the face of this the defendant deposed he not only believed the stone was a sapphire when he sold it, but believed so now; and although he had been ten years in the business, had never heard of a *Nova Mina*. The stone was not his, but belonged to Woods, a cutter, whom he told he could get £12 10s. for it. William Woods, lapidary, stated that the stone in question was cut by him from a number of others he had had some time. He sold the stone as a white sapphire, which he knew from the cutting to be so. A person who knew anything about it could not possibly mistake it for a *Nova Mina*. He had let it go too cheap, as it was worth £6 to cut. John Scott Achison deposed he had been a stone cutter for twenty years, the stone was brought to him by defendant; it was a white sapphire. He had applied various tests, and his practical experience told him it was a white sapphire. The three first witnesses were not practical men. Perhaps the crowning witness was George Meize, Oriental stone cutter, who said an honest dealer could not mistake it for a topaz. Some sapphires were hard, but others were soft (!) Such were the conflicting statements which, we are ashamed to say, were submitted to the jury. The Judge, in summing up, pointed out that it was for the jury to decide whether the stone was a white sapphire, whether it was so warranted, and whether it was fraudulently represented to be so. It had been laid down that a jeweller was responsible, whether he knew his representation of the value of a jewel to be true or false. The verdict of the jury was the stone was not a white sapphire; that it was so guaranteed, but not fraudulently; and awarded plaintiff £40 damages for non-fulfilment of contract. The stone was then returned to the defendant.

As we read through this case we cannot help feeling what a doleful satire it is upon the stone trade. Here are men who come forward and use those high-sounding words which are so often the equivalent of egotistical ignorance, "practical experience," to corroborate such preposterous rubbish as to some sapphires being hard and others soft! or turning round upon Mr. Ford to say he was not a practical man. We unhesitatingly say that when in the future the history of British industries is written, none will be complete which does not give full recognition to the services rendered to them by Messrs. Ford. Granting these last witnesses gave their evidence in good faith, it is lamentable that they should not know the difference between two such distinct stones. No stone in the world is so easily recognised as a topaz; it does not require a second test, nor even daylight to do it. Just passed through the fingers in the dark, it ought immediately to be recognised by anyone; it has such a characteristic slippiness that could not deceive one; and the difference between passing the two kinds of stones through the fingers is as great as one would feel in rubbing the hands together in *soft* and *hard* water, even more so in fact. It is also well to bear in mind the remark of the Judge, that a jeweller is responsible, whether he knows his representation to be true or false.

The Markets.

PLATINUM.

The price of platinum has not shown that upward tendency that has characterised it for so long, but is now a little lower.

SILVER.

It is many a month since the fluctuations in silver have been less than those which characterised transactions during March, rises and falls of a sixteenth being daily reports, always remaining, however, near 45d., its present price.

DIAMONDS.

In Amsterdam the prices have been firm and increasing, one or two carat stones being in great demand for Russia, and during the whole of the month medium size and quality were in great demand. Cutters were well employed, and rough and cleavages found ready sales. In Paris trade has been very active, and speculation has been going on between the home and foreign buyers. In the London markets a great deal of trade has been effected owing to the large number of foreign buyers, with no abatement of prices.

A very great deal of interest continues to be taken in what is described as the English Watch Test Question. A meeting at the London Chamber of Commerce, convened in consequence of this case, was largely attended, and opinions were very freely expressed by the speakers. There is no doubt that the magistrate was bound to convict under the Act; but it must be admitted that, if the description of the watch in question as an English watch was forbidden by the Act, it would, on the other hand, have been decidedly a "false trade description" of the movements to have called it of Swiss manufacture, seeing that the material and the most expensive part of the works were English. However, if such prosecutions may occasionally press hardly in individual cases, they are without question necessary in the interests of the English trade, and their effect cannot fail to be useful.

A highly interesting article by Mr. Jas. A. Poole, dealing with John Harrison's famous Chronometer, which last century gained the Government premium of £20,000, appears in the last issue of the *Observatory*. We regret that pressure of matter prevents our reproducing the article this month. Mr. Poole has recently been entrusted by the Astronomer Royal with the work of cleaning and examining this useful instrument.

Electric Light.

A correspondent sends us the following:—

"In your March number of The Watchmaker and Jeweller you mention the complaint of Mr. H. L. Brown regarding the cost of replacing electric lamps. Two years ago I had six 16-candle power lights fixed in my shop, and I don't think they were renewed more than once during the year. I have since had an electrolier fitted with four 8-candle power lamps. During December, 1890, and January, 1891 (less than two months), I had to buy ten new 8-candle lamps to replace the film breakages. Several lamps only lasted from fourteen to sixteen days. Being a patent and a monopoly, I had no redress. Our electrical engineer then recommended me to use all 16-candle lamps, which I have done. They are much more satisfactory than the small lamps. I should think, from your remarks on Mr. Brown's experience of lamps, he has 8-candle power, which ought to be large enough if they would stand."

It must be borne in mind that whatever be the future that lies before electric lighting, at present it is in its infancy; so little regard is taken to the strength of the current employed, which is everything. If our correspondent simply replaced his 16-candle power by 8-candle power lamps, we can quite understand their breaking. Not only should the strength of the current be regulated by the resistance which the films are able to offer without rupture, but every light, if possible, should be protected by a "fuse," so arranged that it should "go" before the lamp. In this way the spoiling of lamps may be kept at a minimum. We have for some years been in daily connection with an installation consisting of some three hundred lamps, and it is very seldom that a filament goes, all the lamps being protected by fuses. Formerly, if a large number were switched off and a stronger relative current thrown into the circuit, the fuses would go, but by carefully notifying to the engineer in charge the turning on or off, so that he can regulate the strength of current, weeks go by without a filament going. Now, if there were only one ruptured a day the lamps would average a year each; but we certainly go a week and frequently much longer, so that the lamps would average seven years, if we could depend upon this mean! We find the lamps *wear out*, that is, either a darkening film is deposited over their interior, or the bad method employed of using plaster of Paris for fixing the brass work to the glass gives way under the heat generated. A fortune awaits someone who can devise a better system of cementing than plaster of Paris, that will not be affected by the heat. The companies estimate the lamps to run one thousand hours before getting darkened. At the same time we consider that a 16-candle power lamp and upwards is too strong a light to show diamonds off to the best advantage; it gives them a glassy look. A greater number of smaller lights is better. We are now trying the effect of ground glass lamps, which at present answer very well indeed, although there is an obvious loss. At the same time we are greatly obliged to our correspondent, and should be pleased to publish the experience of any of our readers with this illuminant, as it is assuredly the light of the future, which we are certain could not fail to be of the greatest value to others.

Watch and Clock Making.

(Continued from page 195.)

Answers and Notes to Questions set at the City and Guilds of London Institute Examinations.

By I. Hermann,
Director of the Polytechnic School of Watch and Clock Making.

QUESTION (8.)—Describe the douzième gauge, explaining the mode of using it ?

Answer.—The douzième gauge is a practical application of the principle that with constant angles the chords vary as the radii. The extent of the opening of the shorter arms is the measure of the thickness of any object placed between them, and the opening of the longer arms must be as many times greater as the longer arm is the multiple of the shorter one. The principal object of the use of this gauge is to make comparisons between thicknesses, hence the reading of the graduated arc should not indicate circular divisions in degrees, but the chord of each opening should be a multiple of a constant unit.

QUESTION (9).—Why is it necessary that in the ordinary lever watch, pins should be fixed in the plate to limit the movement of the lever ?

Answer.—It is necessary that the lever should remain in such an angular position after the ruby pin has left the notch, that on the return motion of the balance the pin can enter the notch freely without making contact with either corner of it. To prevent the displacement of the lever from this position the locking planes are formed on the pallets, by which the pallets are drawn towards the centre of the wheel, and therefore the lever in the further direction of its impulse motion; but this would cause the lever notch to move beyond the arc described by the ruby pin, hence a limit must be set to this movement, otherwise the ruby pin could not re-enter the notch. This result is obtained by interposing two pins perpendicular to the plane of rotation of the lever, and these pins are technically called "banking pins."

Remarks.—The adjustment of the position of the lever notch, or in other words the "roller-depth," requires always careful attention. The correct position can be ascertained and determined thus :—Close the banking pins till the pin just passes out freely, *i.e.*, to such a position that the least further decrease of the lever movement affects the free exit of the ruby pin. Of course it depends entirely on the structure of the escapement whether this alteration will not produce other evils, but if it does they must be removed by other means. If there is no motion or run of the lever after the escape wheel has dropped off, assuming that the pallet-depth is right, the roller-depth should be made deeper to permit of the required run after drop. A round pin-depth is inseparable from a certain measure of angular motion of the lever after drop, for the simple reason that the ruby pin may sufficiently dip into the notch before the corresponding tooth acts on the driving plane. The measure of this run depends on the pallet-depth and form of ruby pin : a shallow depth and a round pin require more than a deeper depth and flat or triangular pin. The conditions involved in the alterations of a roller-depth are somewhat complicated, for any change in the position of the pallet-holes must affect the banking and angle of pallets in their relative position to the line of centres. It also affects the guard action ; hence I cannot fully enter on the mode of altering this defect without extending my description much further ; I shall therefore postpone this for another time. I may state, however, that with a sufficient practice of filing and of polishing the workman can resort easily to the mode of using the old lever as a templet, leaving the notch a little longer, and adjusting its proper length after the angular position of the pallets and position of banking pins are correctly determined, by holding the crescent of the horns against a rotating circular polisher till the ruby pin just passes out freely. It is assumed that when this result is obtained the guard action is correct and banking pins perpendicular.

QUESTION (10).—Account for the fact that a fusee is often used in spring clocks, but never when the motive power is obtained from a weight ?

Answer.—The object of the fusee is to reduce the pull of the main spring to uniformity, which is effected by varying the radius or armature at which the chain acts inversely to the pull of the spring, so that the moment of the pull is a constant quantity. When an infinitely great number of points are taken, then it becomes a continuous curve, so that as the chain unwinds the force exerted on the centre pinion is constant. In a clock where the pull is produced by the gravitation of the clock-weight, which is constant for the same latitude, this force requires no modification, and therefore no fusee.

QUESTION (11).—What is the difference between a detached and undetached escapement ? Give an example of *(a)* the dead beat detached escapement, and *(b)* the dead undetached or frictional rest escapement ?

Answer.—The time occupied by the motion of the escapement or train during impulse forms but a small fraction of the time of each vibration of the balance or oscillation of the pendulum. During the remainder of the interval between one impulse and the succeeding one the train is at rest, but the energy of the train is active, hence exerts pressure. When there is an intermediate arrangement between the escape-wheel and balance or pendulum, which *blocks* the motion of the escape-wheel so that the balance or pendulum performs its marginal motion perfectly, free of every influence of the escape-wheel, then an escapement with such a provision is termed "detached." In the absence of any such "intermediate action" the escape-wheel is acting directly on the axis of the balance during the whole of its motion, hence, since the balance or pallets in a clock move under pressure, we have a condition of friction, and thus combining the two conditions of friction as relates to the balance or pallets, and of rest as relating to the escapement, it is defined as "a frictional rest escapement." As an illustration of (*a*), the chronometer escapement may be quoted. At the end of every impulse action of the escapement the escape-wheel is locked by the pallet of the detent, so that the balance performs its supplementary arc free of the escapement. The horizontal escapement is (*b*), one of "frictional rest," dead beat escapement. As one driving plane completes its impulse, and leaves the cylinder, the point of the adjacent tooth is arrested by the circumference of the cylinder and presses against it during the two semi-supplementary arcs of the balance, until the lip or impulse edge of the cylinder passes the circle of the base of the driving plane; hence the balance moves under influence of pressure and friction on the cylinder.

QUESTION (12.)—What is the object of the pin fixed in the circumference of the balance of a cylinder escapement ?

Answer.—The balance cannot move beyond a certain point without risk of disarrangement of the actions of the escapement as well as risk of injury; when the point of a tooth rests against the outside surface of the cylinder, and the arc of the balance due to the impulse given by the tooth that has just passed out of the cylinder is of such an extent as to carry the lip on which the last impulse was effected within the circuit of the points of the teeth, the tooth resting on the outer surface of the cylinder makes a small forward motion and takes its position within the cylinder; the balance is thus completely blocked. The tension of the balance spring tends to rotate the cylinder in a direction which urges the passage against the base of the tooth, while the return motion of the escape-wheel is prevented by the inner surface of the cylinder blocking the back of the tooth. The same position is reached if the balance vibrates in the opposite direction, but the important difference in the conditions of the two like geometrical positions is this: in the former the tension of the spring is a direction that produces the blocking, while in the latter it reverses it; hence in the former it produces a complete disturbance to motion, and in the latter only a disturbing effect on time. To prevent this disarrangement, the pin is placed in the rim of the balance to limit its motion, by contact against some other rigid object which is generally a pin in the balance-cock, or seconds pinion-arbor.

Remarks.—It is desirable to see that the escapement is secure from over banking. It is found rather frequently, that on one side the escape-wheel has a small recoil just before the balance reaches the banking. The cause of this is mostly found in the fact that the passage is not deep enough; in the general way of repair this can be easily remedied by using a small rotating disc of fine oilstone or charged with diamond dust, sometimes called "ruby files."

These remarks close the paper on the "elementary section."

(To be continued.)

Transatlantic Jottings.

Both Sides of the Atlantic.

ISOLATED by the dignity of antiquity and numerous other factors which underlie the social constitution of the high art profession of the jeweller in England, he is quite unable to realise the fraternal bonds that surround the same trade on the western side of the Atlantic. In every city or centre throughout the United States there exists an association for the discussion of all matters which pertain to the general weal of its individual members; the newest thing in the market, the best way to get it; the best way to get over this, that, or the other difficult job. Everyone meets on a common footing, and is willing to give his brother the benefit of his advice or experience. The action of Congress in regard to matters which directly or indirectly concern the trade is watched and discussed; and when banqueting-time comes round, whoever knows a prominent Congressman asks him to the banquet. He comes and enters into their affairs, and is interested and watches them in future in Congress. It is only just lately that British jewellers are awaking to the necessity of united action. If the Clerkenwell watch trade had done five-and-twenty years ago what they are doing in Birmingham to-day, the tens of thousands of watchmakers found in the United States would probably most of them be doing something else. There is also a probability that the Merchandise Marks Act will establish the necessity of united action through all the trade.

Watch Factories Items.

THE Elgin National Watch Company propose exhibiting at the World's Fair a model of their factory, covered with the same enamel as is used for their dials. They are about fitting up a printing office of their own. Last year 12,594·04dols. were paid in taxes by the company. It is computed that the night watchman of the factory covers between sixteen and seventeen miles every night. The company has lately been putting in 800 tons of ice from Crystal Lake.

The Hampden Factory has reopened with part of its hands. The order of the Court is not for full resumption, but for the finishing of 6,000 to 8,000 cases on which 40,000dols. of work has been done. It will cost 15,000dols. to complete them, which will make them worth 80,000dols.

The assignment of Dueber is lifted, and things are said to now be on a better footing than ever. At a recent banquet Mr. Dueber said, "I found that I had been entrapped, and I did the only thing I could do, and the thing I thought best to do—I uncovered myself to the world. I was betrayed and tricked, but the traitors are unmasked."

The pay roll at the Waltham Factory now is over 2,845, over 2,000 watches being turned out a day. The *Waltham Free Press* claims they are the best paid watchmakers on earth.

Columbus citizens have taken 250,000dols. stock in the watch factory to prevent its being removed to Drayton.

The Trenton Watch Company have just put on to the market a new seven-jewel eighteen-size movement, made in two styles, open and closed plates, the barrel of which can be removed without disturbing the train or stem winding parts, the latter being so arranged that the same movement can be made to wind at figure 12 for open face, or at 3 for hunting case.

"On Approval."

NOW that so many of our jewellery houses, to say nothing of diamond merchants, have businesses in New York and elsewhere, a recently settled point of American law may be extremely interesting and valuable:—

The Supreme Court of New York has handed down a most important decision regarding the title of goods sent out "on approval" or "on memorandum." The decision was rendered in the old suit brought by Alfred H. Smith and Co., diamond dealers, of New York City, against Henry Clews, a broker. The principle involved was the ownership or title of goods sent out "on memorandum," as the practice is commonly known. The suit was decided in favour of Messrs. Smith and Co., and their plea sustained, which in substance is that the title of goods sent "on memorandum" remains with the owner until an invoice is given on the received actual payment for them. The decision established the fact that a person receiving goods "on memorandum" cannot sell them to others with a clear title, simply because they themselves have not acquired such a title. And, further, that possession of personal property does not insure ownership, and that even innocent purchasers must surrender goods bought in good faith to the owner, when his title is established. The suit has been long—nine years—and hotly contested at eight trials and appeals from former verdicts, and now that it has been definitely settled in such a decisive and satisfactory manner is a cause for congratulation, especially to Messrs. Smith and Co., who have contested the suit at much expense and trouble.

Horological Notes.

ORIGINAL AND "CLIPPED."

Liverpool Watchmakers and Jewellers' Association. At a general meeting of this association there was a fair attendance, including Messrs. W. A. Newcomb, W. J. Nash, T. N. Jackson, W. J. Morris, E. Bellis, John Croasdale, W. Edwards, W. H. Blunt, J. J. Stokes, E. Powell, W. Willday, A. E. Newcomb (secretary), and others. Mr. John Bryant presided, and said that meeting of the trade had been called to consider three questions, viz., the abolition of hall-marking, the abolition of the plate license, and the advisability of drafting a minimum list of charges. Referring to the question of hall-marking, he said it was a recognised fact that hall-marking was one of the most ancient institutions of this country, and it was a good one. At present it was partly voluntary and partly compulsory, which should be remedied. (Cheers.) With the abolition of the hall-marking with respect to gold and silver goods, one thing was certain, that the public would not have that protection which they possessed at the present time. The vast majority of the public when purchasing their goods looked for and asked if the articles were stamped, and on being satisfied that they were so a sale was readily effected. On the other hand, unstamped goods had no value in the market, and by abolishing the hall-mark inferior goods would be sold at a standard price. Turning to the all-important question which was now agitating this country, namely, the plate license, he said there was no doubt that at present they were heavily handicapped by it, and it should either be entirely abolished or more strictly enforced on those who deal in watches, jewellery, etc. After referring to the injury done by agents of watch clubs, he said in no case, as far as he was aware, had any one of these agents taken out a license, and the consequence was that everyone seemed glutted with watches and jewellery. He thoroughly upheld the principle of the plate license, and would strongly oppose its abolition. It should be enforced with the utmost vigour on all who trade in gold and silver goods, without distinction as to weight. Surely watchmakers and jewellers had as much right to protection in their calling as licensed victuallers, tobacconists, and others. The infringements of the liquor and tobacco laws were comparatively few and far between, but those in connection with the watch and jewellery trade were legion. Undoubtedly the abolition of the plate license would have a far more prejudicial effect upon many existing tradesmen than the present illegal agencies, because a great many other different businesses would embark in the sale of watches and jewellery of good, bad, or indifferent qualities, which the license kept back from so doing, and if it was abolished it would be the cause of the legitimate watch and jewellery businesses being positively split up. Mr. W. J. Morris supported Mr. Bryant's remarks, and moved—"That this meeting is of opinion that the plate license is a protection to the trade if it were strictly enforced, and that, instead of it being abolished, it should be retained and strengthened by increasing the amount of the license in proportion to the rent paid by the seller." This was seconded and supported by Messrs. T. N. Jackson, W. A. Newcomb, W. H. Blunt, and E. Bellis, and was carried unanimously. After a vote of thanks to Mr. Bryant had been passed the meeting terminated.

* * *

Another Association. A meeting of the executive council of the Affiliated Watchmakers' Association of London, Coventry, Prescot, and Liverpool was held at Coventry. Mr. Fred. Richards (London) reported that he had attended the sittings of the Federated Council of Trades Unions at Sheffield, when Mr. Broadhurst's Bill to amend the Merchandise Marks Act was discussed. The draft Bill with the amendments agreed upon were then brought before the meeting, the clauses being in the main agreed to. Upon the motion of Mr. Benson (Liverpool), a draft clause prepared by the London Association was adopted, to be submitted to Parliament as an addition to the Bill. It was afterwards resolved to appoint a suitable person to conduct prosecutions in the interests of the trade. The forthcoming meeting of the London Chamber of Commerce, at which resolutions affecting the trade are to be brought forward, was then discussed. Eventually the following resolution was passed, upon the motion of Mr. Eagles (Liverpool):—"That in the opinion of this council, representing the watchmaking trade of England, it is very undesirable that any system of marking should be adopted, as suggested by the London Chamber of Commerce, that shall lead to the establishment of a trade custom opposed to the spirit of the Merchandise Marks Act, and that we hereby resolve to use our utmost efforts to prevent any weakening of its clauses." Prescot was decided upon as the next place of meeting.

* * *

Chapelfields District and Watchmakers' Philanthropic Institution. The committee beg to acknowledge the receipt of the following donations, and to return sincere thanks for the same:—Amount of grant voted by the subscribers to Cotton Factory Operatives' Relief Fund, per the Mayor (Ald. C. J. Hill, Esq.), £25; Mrs. P. Barrow, 10s.; Mr. Councillor M. Dodwell, 10s.; Mr. Councillor A. H. Drinkwater, 10s.; Mr. Rowland Hill, 10s.; Mr. Batting (Spon-street), 5s.; Messrs. G. and R. Beesley, 5s.; Mr. F. Bird (Spon-street), 5s.; Mr. Ernest Jones (Smithford-street), 5s.; Mr. R. J. Pike (Earlsdon), 5s. Two Hospital tickets from Mr. Ernest Jones; three ditto from Mr. Shakeshaft. Further donations, either money, Hospital, Eye Infirmary, or Dispensary tickets, will be gladly received. E. Ball, 88, Spon-street, president; H. Coldicott, Mount-street, vice-president; F. H. Smith, Craven-street, treasurer; John T. Lower, 20, Duke-street, secretary. The third annual Flower Show in connection with the above is fixed for Saturday, July 18th. Schedules will shortly be ready.

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The Watchmakers and Jewellers and Stanley Hospital. The committee of this association have under their consideration the advisability of holding a grand ball and concert in aid of the above noble institution. This titled association, which is supported by all our leading members of Parliament, and of which Mr. Ralph Neville, Q.C., M.P., has been elected president for 1891, would undoubtedly prove a substantial benefactor to the above humane and thoroughly deserving charity. The committee will probably engage St. George's Hall, and *artistes* wishing to help should write to either John Bryant, chairman, Prescot-road, Fairfield, and William Nash, treasurer, 450, Scotland-road; or A. E. Newcombe, Secretary, Liverpool Watchmakers and Jewellers' Association.

* * *

Mr. Newcomb and the Liverpool delegates. Mr. Newcomb has written the following to a Liverpool contemporary:—

"I notice a paragraph in the local news stating that the Liverpool Association had sent four delegates to Coventry. These self-elected delegates are not from the Amalgamated Society of Liverpool, and I would like, through the columns of your valuable paper, to inform our members that they do not represent the trade as far as we are concerned, as our association have not been invited to send delegates to the conference. We are, however, pushing forward with the further strengthening of the Merchandise Marks Act, and we expect a reply from Baron H. de Worms, M.P., upon the question and the action Parliament intends to take in the matter. I would also remind our members that the four gentlemen named are not watchmakers, but casemakers, who have on other occasions taken upon themselves the self-elected confidence of posing as the representatives of the trade, whom they never consult at all upon the matter. It would also be interesting to our members to know that one of these gentlemen who was sent (I should say took upon himself) to represent the Liverpool watchmaking industry, in giving his evidence before the commission, deliberately proved himself an enemy to the men he was supposed to represent by informing the commission that he had his watch cases made and hall-marked in London. I trust our members will in no way give encouragement to those who are attempting to stab us in the dark. I would also like to prove whether this so-called association exists by asking for a copy of their rules and where they hold their meetings, as we do not go into any hole-and-corner place to represent the trade. We appeal fairly and straightforwardly to our brother workers, and I consider we have a just right to expose those who pose as representing this skilled industry."

Goldsmiths and Jewellers' Institution.

At the Horological Institute, Northampton-square, Mr. F. B. Thomas presided over a crowded gathering of the subscribers to the above. The special business was to receive the 128th half-yearly report and to elect two annuitants and one almsman. The total receipts of the financial year were stated to amount to £2,613. The hearty thanks of the committee were tendered to the Lord Mayor for his kindness in presiding at the recent festival dinner at Goldsmiths' Hall. The accounts, which accompanied the report, showed that the invested capital now amounted to £10,810. The payment to annuitants had been £1,186, and payments to inmates of asylum, £60 6s. 8d. ; and £43 15s. 9d. had been expended on coals and special grants. The Chairman, who moved the adoption of the report, congratulated the meeting on the success which had attended the year's operations. Passing on, he paid a high compliment to the Secretary (Mr. J. L. Innocent), stating that during his ten years of office the subscribers had increased 50 per cent., and the donations and the funded property 25 per cent. Consequently, the committee proposed to increase Mr. Innocent's salary to fifty guineas per annum. The report, balance-sheet, and last-mentioned proposition were carried unanimously. Next came the report of the scrutineers of votes for the elections of the night. This business gave rise to considerable discussion, the subscribers objecting to one of the candidates on the ground that he was not qualified by virtue of the number of payments he had made, and although Mr. Thomas is to be greatly admired for the strenuous effort he exerted to bring about a satisfactory alternative, he was unable to arrive at any definite conclusion, although he remained in the chair till a very late hour, and in common with all those present we can only feel sorry for the unenviable position in which he found himself on that occasion.

The Coventry Watch Trade Protection Association.

The third annual meeting of the Coventry Watch Trade Protection Association was held on the evening of the 23rd of February, at the Hen and Chickens Hotel, Butts, Mr. S. Yeomans, the president, occupying the chair. The gentlemen present at the meeting included Messrs. C. Read, H. J. White, T. Price, J. A. Jelks, D. Hannah, Loverock, Bedder, W. Matthews, G. J. Hollins, J. Wilday, T. D. Smith, Gurney, Pyott, Pritchard, and S. Farren (secretary).

The Chairman said his first duty, and it was a painful one, was to refer to the death of their late chairman. It did not seem long since Mr. Newsome occupied the post he (Mr. Yeomans) did that night, and he was sure all the members deplored the loss they had sustained. Mr. Newsome took a deep interest in the association; he was one of the first to start it, and the trade had lost a very good friend in him. The past year had been a fairly good one for the association, but he regretted the falling away in the number of members, ascribing the fact to the belief of people that there would sure to be a certain few take an interest in the working of the Act. The number of people engaged in the local watch trade he estimated at 3,000 or 4,000, and he thought the association ought to possess 1,000 members. Mr. Newsome pressed on the Select Committee of the House of Commons the need of a public prosecutor to enforce the Act, and the chairman advocated the consolidation of all the Watch Trade Protection Associations, and said a conference on the subject would shortly be held in Coventry. The Act had been of benefit to the trade. Foreigners advertised and puffed their trade, whereas Coventry men had gone slowly on, content as long as they could get a little trade. The prosecutions had been an advertisement to the English trade. (Hear, hear.)

Mr. S. Farren read the annual report. The committee had held ten meetings during the year, all of which were well attended. In April last a conference of watch trade representatives of London, Coventry, Prescot, and Liverpool was held in town, and Messrs. Yeomans, Price, and Jelks were appointed on the executive committee of an association then formed, and a resolution was passed in favour of the Board of Trade enforcing the provision of the Merchandise Marks Act. The committee were successful in getting the Select Commitee of the House of Commons to allow a Coventry witness to attend their sittings and be examined, and the late Mr. Newsome gave evidence as to the working of the Act. Attention was drawn in the report to the great benefits the trade generally had derived from the action of the association. The committee therefore regretted to report a diminution in the number of members, which, being 266 in 1888, was at the present time only 166. The total income for the past year was £20 7s. 3d., and the expenditure £25 6s. 2d. During 1890 two important prosecutions were instituted and fines imposed, and further similar action was contemplated. Seeing that the funds of the association were not in so good a condition as they could wish, the secretary undertook to raise the sum of £100 or £150 in the trade to form the nucleus of a guarantee fund, and about £60 was already promised, including £2 from Mr. Ballantine, M.P.

Window Smashing.

During the month there has been two cases of deliberate window smashing by men suffering from *delirium tremens*, one being a window of Messrs. London and Ryder, New Bond-street, the other that of Messrs. J. W. Benson, Ludgate-hill. In the latter instance the perpetrator brought with him two large boulders, probably from the river side, to effect the destruction ; and although the first missile went through with an awful crash, doing further damage as it reached the gold watches, the delinquent followed it up with the second, making no attempt to escape. At the police-court it was proved that only a few months ago he had been guilty of a similar offence in Cheapside, on which occasion he was let off with a fortnight's imprisonment; in this case his sentence was only extended to three weeks, which we must all consider a very lenient one for such a rascal.

Midland Jottings.

(By Our Birmingham Correspondent.)*

THE case of Francis Henry Fellows, tried under the Merchandise Marks Act for having sold a falsely-marked watch, was decided against the prisoner at the recent assizes in Birmingham. He was sentenced to four months' imprisonment with hard labour (! !) The prisoner was a pawnbroker, and he appears to have accepted a pledge of the watch marked 18-carat, and advanced £3 10s. on it. On October 30th it was included in a sale of unredeemed pledges at his father's auction rooms, and bought in at £5. He then became suspicious as to its value, and having had it tested found it to be falsely marked. On November 20th he again offered it for sale as a "keyless watch," and it was bought at £3 9s. The purchaser discovered its value and spoke to the prisoner the next day, who, however, refused to return the purchase money. The watch was then taken to the Assay Office and the matter placed in the hands of the solicitors to the office. We shall no doubt hear a great deal more about this.

A CASE of watch stealing in Birmingham on January 12th last, resulted in the sentencing of the robber, Thomas Williams, a shoemaker, to ten years' penal servitude. It was a case of street robbery at night, the victim being attacked in one of the central streets of the city. The police were quickly on the spot, and secured the prisoner as he was attempting an escape, after a vigorous hunt through various passages and back yards.

PAWNTICKETS for twenty-three watches and a few other articles are not a bad record for a man to make. It was made by William Bond, who was sentenced to two months' imprisonment at Cheltenham the other day. The articles belonged to a Clifton firm represented by the prisoner. Several pawnbrokers were censured by the Magistrates for having received some of the pledges.

MR. CHARLES BANNISTER, of Great Hampton-street, Birmingham, issues a useful illustrated catalogue and price list of jewellers and watchmakers' tools and materials, post free on the receipt of a business card. The list includes files, nippers and pliers, glasses, hands, keys and swivels, bars and joints. Mr. Bannister also repairs watches for the trade, and executes gilding, silver-plating and nickelling.

MESSRS. WILLIAM VALE and SONS, of Unett-street, Birmingham, are well engaged on wholesale orders for their new electric pencil and "Syphon" Penholder, of which they are the sole patentees and manufacturers. They are also well supplied with orders for gold, silver, and aluminium-gold pencil cases of the various well-known designs that are always in demand.

IT is claimed for the registered "Gripper" thimble, which may be obtained through any wholesale house, that it is the only thimble made which grips the needle and prevents its slipping off into the finger, and that it will wear longer than two or three silver thimbles of the ordinary pattern. It is so constructed that the shape of the holes causes all the pressure to impose on the strongest part.

MESSRS. MILLER AND CO., of Vyse-street, Birmingham, have introduced an excellent substitute for silver in their "Cairo Silver," which is white throughout and not plated, and is applied by Messrs. Miller to the manufacture of alberts, guards and necklets, lockets, seals and brooches, bracelets, bangles and rings; as well as to match-boxes and cigarette cases.

MR. J. GLOSTER, of Vyse-street, Birmingham, is making, for the wholesale trade only, an extensive series of medals and crosses for athletic sports, and combines with this business that of the manufacture of jewellers' materials in silver and gold, including bolt rings, earstuds, and sleepers, the latter article being a specialité with the firm.

MESSRS. LUCAS BROS., of 22, Hylton-street, Birmingham, have converted their business into a private limited company, the capital being subscribed by a few friends of the firm, for the purpose of dissolution. The secretary of the company is Mr. Edward H. Lucas.

MR. HENRY H. ASTON, of Regent-place, Birmingham, makes a specialité of 9-carat Hall-marked wedding rings, of which he sells large numbers annually.

MR. F. BRUETON, of 2, Northampton-street, Birmingham, manufacturer of cases in velvet, plush, leather, etc., for jewellery and electro-plate goods, who has been established for nearly half a century, has just introduced what will prove a distinct boon to the trade in the form of a new case. The idea is quite fresh, and Mr. Brueton has registered it under the number 165,497. It may be applied to all sorts of cases for finger or napkin rings, and is supplied with linings of various colours and materials. The principle of it is a double hinge, between which the cushion for holding the article is placed. It is reversible, and while it opens out large so as to make a good display when open, when closed it is very compact and portable. It has been applied largely for finger ring cases, and the firm are now extending the idea to napkin ring cases also, by means of a new kind of spring holder they have introduced, which will effectively hold any shape ring in place. For illustrations see Mr. Brueton's advertisement.

I WOULD call attention to the admirable illustrated catalogue and price list which Messrs. Ginder Bros., of 47, Frederick-street, Birmingham, have just issued. It contains drawings of every species of jewellery it would appear, for it is very extensive, including over six hundred designs. The first four pages consist of drawings of rings exclusively, and this is the main business of the firm, who undertake to forward a selection of 9-carat gem set rings from 4s. upwards on application. After the rings follow several pages of brooches in infinite variety, followed by five pages of bangles and bracelets, many of which are of excellent design. Lockets and pendants, and watch-chains, and alberts, take up the next few pages, and four pages are devoted to watches. Masonic ornaments, medals and badges are well illustrated, and the sheets are concluded by a number of illustrations of fancy articles, such as pocket knives, fruit-knives, pencils, and sleeve links. Altogether, it is a most useful list, admirably compiled. Its usefulness is heightened by the fact that the price list furnished at the end of the book is printed on perforated sheets which may easily be removed at the pleasure of the possessor. The calendar for 1891, which has been issued by Messrs. Ginder, is a useful card for any retail jeweller to have hanging about.

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Owing to over-pressure of many important matters this month, we are obliged to leave out "Our Letter from the Diamond Fields," the most interesting item of which is, perhaps, the discovery of a 400-carat stone.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

Sheffield Notes.

(By our own Correspondent.)*

CAREFUL and pointed enquires among silversmiths have not elicited any complaints as to the state of trade. If this way of putting it be regarded as of a negative character and appears of sinister omen, it must be remembered that there are those who maintain that the tide is on the turn. When the price of coal goes up and the price of iron comes down, it is only natural to anticipate the inevitable result, unless the process is checked. The silver and electro-plate trade, however, if it is the last to feel the effects of a revival in trade, is also the last to participate in its declension. Depending for their prosperity to a large extent on the dividend-receiving class, silversmiths reap much of their harvest long after the fruits of the earnings of other people have been gathered in. And so it happens that at present replies to inquiries as to the state of business are of a satisfactory, if not of a very exultant character.

I HEAR that a certain firm, who some years ago rebuilt their premises on a particularly extensive scale on the strength of retaining the custom of a wealthy syndicate, and who lost such custom about eighteen months ago, have recently, by a lucky stroke of fortune, succeeded in regaining the confidence of their old clients, and are the happy recipients of an order for spoons and forks which will keep them well employed for many months. What is their gain, however, is the loss of another firm who, fortunately for themselves, do not carry all their eggs in one basket, and will thus be able to survive the loss.

THIS being the slack season as far as the silver trade is concerned, the energies of manufacturers are usually devoted at this period of the year to the development of some new idea. So far, however, nothing very original has been produced, although several novelties are said to be in hand, and may be in the show-rooms before the month is out. Messrs. Round and Son's adjustable reading lamp having been in the market last year, can scarcely be called new, but its artistic excellence, together with its size, nevertheless constitute it a prominent feature in that company's show-room.

THE show-room of a first-class house is a good index to the public taste. From the contents of the show cases this season, we gather with pleasure that the taste for raised chasing is reviving. Why this beautiful branch of the silversmiths' art has fallen so much into disuse of late it is difficult to imagine, unless it be the demand for the "cheap and nasty" which obtains during periods of trade depression. The old cake basket, too, is again being asked for, and, as a consequence, takes its place in the show-cases. We note also that mixed glass, that is, glass of different colours or different shades of the same colour, is in demand in connection with articles formed of a combination of silver and glass.

THE demand is again being made for some legislative action in the direction of compelling manufacturers to distinguish between true ivory and its imitations. Xylonite is made so closely to resemble ivory that buyers are subject to great inconvenience and sometimes loss. The great increase in the price of ivory of late years renders the introduction into the market of a substitute inevitable. It is unfortunate, however, that one of the most common substitutes has taken the form of a close imitation of the real article. As a great quantity of ivory is used in the silver trade, it is easy to see how the possibility of deception affects trade competitions. It is felt that the salutary law against false marking might be so amended as to include ivory and its substitutes, and compel manufacturers and shopkeepers to indicate the difference.

IT cannot be denied that there exists at present in Sheffield a certain amount of anxiety in the minds of the more experienced business men as to the state of trade in the near future. As the results of the year's working of the different companies are declared, one begns to understand this feeling. True, two at least of the large steel houses have declared the phenomenal dividend of 25 per cent., and some others the satisfactory dividend of 12 per cent. On looking closely into the matter, however, we find that these large dividends are mostly confined to the houses which own their own coal pits. Other firms who have had less foresight in the past, have found that while the volume of trade during the past year has been all that could be desired, their profits have been swallowed up in the enhanced price of fuel. In the lighter industries, too, the uncertainty of the development of the situation consequent on the McKinley tariff, gives rise to anything but a hopeful feeling. On the whole, therefore, although at present there is little beyond the ordinary slackness incidental to the season of the year to complain of, it cannot be said that there is the same spirit of hopefulness as to the future as was evinced at the same period last year.

THE increased tendency of the silver and electro-plate trade to centralise itself in Sheffield is seen in the gradual increase in the number of those firms which have their headquarters in London or Birmingham. Middle-aged men can remember the time when the trade was about equally divided between Sheffield and Birmingham. All this is now changed, and the process of change is still going on in favour of ourselves. This, taken in connection with the structural alterations and enlargements which are being carried out in nearly all the old-established houses, seems to indicate that over and above all the fluctuations of trade, steady and substantial progress is being made.

MR. H. E. HOOLE, the founder of Gren-lane Works, whose death was noticed last month, was the possessor of a fine collection of pictures. These it is understood will shortly go to the hammer, after being exhibited for a few days at the Cutlers' Hall.

SPEAKING of pictures reminds me that Mr. Chas. E. Wilson, whose drawings have been for several years a feature in School of Art Exhibitions, has this season exhibited three pictures in the Exhibition of the Royal Institute of Painters in Water Colours. All three have been sold and remain in London. Several of Mr. Wilson's pictures may be seen in a collection of paintings now being exhibited in the Cutlers' Hall, and from which several good works have recently been sold, and will go to increase several local collections.

ONE immediate effect of the passage of the McKinley tariff bill is noticed in the falling off of the Sheffield cutlery export trade to the United States. The exports to this country during October, November and December, 1889, amounted to £62,350. In the same months of 1890, it had fallen to £28,178. Some part of this result was due, of course, to the fact that the American market became overstocked during the months immediately preceding the passage of the new tariff. But the drop in cutlery exports was no doubt in part due to the increase in the tariff.

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Scientific and Otherwise.

Proposed Mining and Metallurgical Institute for London.

We are pleased to announce that preliminary steps have been taken to establish in London an Institute of Mining and Metallurgy. The matter has all been thrashed out, and a committee appointed to decide upon the best steps to be taken, consisting of Messrs. Cox, Moreing, Mills, and Ferguson. These names are a sufficient guarantee for carrying out the thing as it ought to be, especially as far as the noble metals are concerned.

Silver not High Enough Yet.

According to estimates for the approaching financial year the expenses at the Kongsberg Silver Works will be 666,000kr., and the receipts 568,000kr., leaving a deficiency of 98,000kr. This unsatisfactory result is owing partly to heavy expenses for the extension of old mines and partly to the output of pure silver having been estimated at only 4,500kil., although as much as 6,000kil. have been obtained in previous years.

Platinum and Aluminium.

It is estimated that from eight to ten million incandescent lamps will be made in the United States during the present year, in which there will be consumed about 125,000oz. of platinum, *i.e.*, supposing platinum to be exclusively used. But there are numerous other substances being experimented upon throughout the civilised world, and Bradford McGregor, a Cincinnati expert, is said to have solved the problem by joining glass and aluminium in such a perfect manner that they can be turned upon the lathe, when it is impossible to detect the slightest flaw at the juncture. Should this turn out true, it will be the deathblow to the high price of platinum.

Origin of Gold in River Deposits.

Professor Liversidge, of the University of Sydney, has found that certain fungoid growths have the power of removing gold from water containing it in suspension or in solution. Bottles of distilled water containing finely divided gold which had been reduced from a weak solution of the chloride by phosphorus dissolved in ether were allowed to stand for some years, and it was observed that while some of them cleared, others retained the ruby or purple colour characteristic of gold thus reduced. It was found that the clear bottles had a growth in them, which under microscope appeared as a mass of filaments which, when dried, were of the lustre and colour of gold. The Professor finds that cheese mould, bread, and other organic bodies will also remove gold when placed in water containing it either in suspension or solution.

We should be the last in the world to depreciate the valuable work of Professor Liversidge, and with him this no doubt is an absolute new discovery; but at the same time the latter has been known for many years. We recollect hearing a paper touching upon this subject describing how, under certain conditions, any organic matter facilitates the deposition of gold from solution. A certain professor waggishly remarked that he supposed a man fishing in a stream contributed to its deposition by the action of his cork float.

Production of Precious Metals.

The annual reports by Wells, Fargo and Co. show the following as the production of silver and gold in the States and Territories west of the Missouri, exclusive of British Columbia and the north coast of Mexico. The figures for recent years are not claimed to be more than approximately exact, as the facilities for transporting the precious metals are no longer monopolised by the express companies as they used to be:

Year.	Silver. Dollars.	Gold. Dollars.
1870	17,320,000	33,750,000
1871	19,286,000	34.398,000
1872	19,924,429	38,177,395
1873	27,483 302	39,206,558
1874	29,699,122	38,466,488
1875	31,635,239	39,968,194
1876	39,292,924	42,886,935
1877	45,846,109	44,880,223
1878	37,248,137	27,576,030
1879	37,032,857	31,470,262
1880	38,033,055	32,559,067
1881	42,987,613	30,653,959
1882	48,133,039	29,011,318
1883	42,975,101	27,816,640
1884	43,529,925	25,583,567
1885	44,516,599	26,393,756
1886	52,136,851	29,561,424
1887	50,833,884	32,500,067
1888	53,152,747	29,987,702
1889	64,808,637	32,527,661
1890	62,930,831	31,795,361

In the States and Territories west of the Missouri River, including British Columbia: Gold 32,156,916dols.; silver, 62,930,831dols.; copper, 20,569,092dols.; lead, 11,509,571dols. California produced in gold, 9,896,851dols.; silver, 186,253dols. Nevada—gold, 2,693,884dols.; silver, 6,546,652dols. Oregon—gold, 965,000dols.; silver. 71,000dols. Washington—gold, 194,000dols.; silver, 85,000dols. Idaho—gold, 3,595,333dols.; silver, 10,229,167dols. Montana—gold, 2,764,116dols.; silver, 32,050,339dols. Colorado—gold, 4,210,961dols.; silver, 13,064,486dols. Utah—gold, 88,798dols.; silver, 12,170,377dols. New Mexico—gold, 376,034dols.; silver, 1,282,951dols. Arizona—gold, 1,150,486dols.; silver, 6,446,863dols. Dakota—gold, 3,045,560dols. Texas—Silver, 249,423dols. British Columbia—gold, 361,555dols, Mexico—gold, 12,689,000dols.; silver, 415,645,000dols.

* * *

The old-established firm of Messrs. Clémence Frères, of Les Bois and Chaux-de-Fonds, and of London, have taken over the business of Messrs. George Carley and Co. The name of the latter firm will be retained. Messrs Clémence Frères have in consequence of the change removed from their old address in Southampton-row to 30, Ely-place, Holborn, E.C., where in future their business will be conducted. The associated firms will be able to supply both English and Swiss watches of the highest quality, for which they have long been individually noted.

We wish to remind our readers that the Lord Mayor has kindly consented to preside, supported by the Sheriffs, Major George Lambert, F.S.A., and other influential gentlemen, at a festival dinner in aid of the funds of the Clock and Watchmakers' Asylum, New Southgate, on the 8th of April, in the Hall of the Goldsmiths' Company, the use of which has been kindly granted by the Court.

We regret we have been unable to report a course of lectures now being given at the Mason College, Birmingham, by Mr. Thomas Turner, but hope to be able to do so on a future occasion.

The Trade of the Country.

Few can probably remember more unpropitious weather in March than that to which we were subjected, especially during the earlier and middle part of the month that has just passed. The record was one of fogs and frost continually, only slightly altered by blinding blizzards and snowstorms; nor were the latter of local occurrence, but extended from Scotland to Devonshire, where trains were snowed up for days. It is therefore no wonder that the general state of trade was very unsatisfactory, as no one would venture out of doors unless really obliged to do so; still, in the midst of it all, inspired by the bright days when they made their appearance, or determined to defy the sickening weather, buyers sallied forth, and many were favoured with exceptionally good days' trade; hardly sufficient, however, we should think to make up anything of a good month. On the whole the London reports sent in are favourable. A number of houses report trade as "good," "fair," or "middling"; but there are no very strong terms employed, whilst from here and there comes the complaint that trade is "indifferent."

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The British United Clock Company report export and home trade both fair; they are also bringing out a new lever carriage clock, a cheap good line in which has long been needed.

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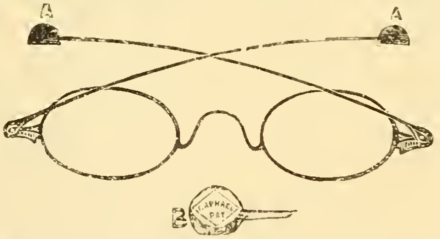
Mr. J. Raphael, Optician, 13, Oxford-street, W., reports that he has more work than he can get good workmen to do, and wonders how it is that, considering he is willing to pay *good wages*, really capable, steady men should be so hard to obtain. Mr. Raphael has the services of Mr. C. Wilkinson (late of the spectacle-room Moorfields Eye Hospital) to superintend the carrying out of oculists' prescriptions. Their monthly dispatches to the country trade are now reaching five figures. One of their lines is the arrangement shown in the woodcut; it remedies the nuisance experienced by all continual wearers of spectacles of having the ends probe painfully into the skin behind the ear. It consists of a rubber pad, which is fixed firmly upon the frame by the latter being made barked; for comfort they are decidedly the best thing that has been brought out.



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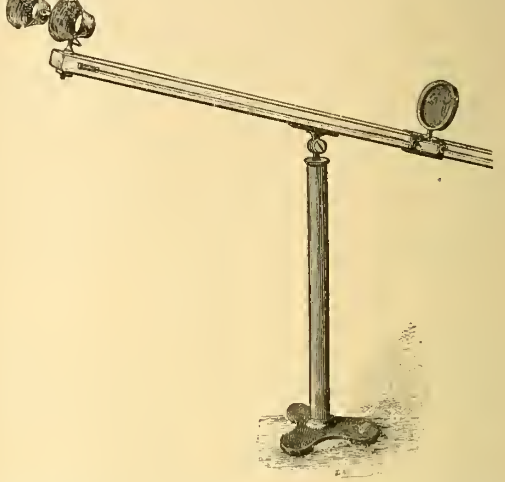
Mr. J. Bruton, of Enamel Works, Hedge-lane, Lower Edmonton, reports he has completed his new premises and fitted it with machinery for making and pulverising enamel. He is also fairly busy.

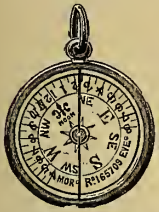
* * *

Messrs. Botwright and Grey, of Clerkenwell, are still receiving many orders for Mason's Improved Optometer, an instrument for accurately testing the eyesight—the illustration shows the instrument. A large number of these optometers have been sold since their introduction about two years ago, and sent to all parts of the world. The instrument is admitted by scientists to be one of the best in use for measuring the loss of power of the eye; and the press has been unanimous in its praise. It was exhibited at the Royal Institution, London, on April 13th, 1889, on the occasion of a lecture by Lord Rayleigh, when it attracted much attention and was officially described as a valuable and interesting contribution. The inventor of this instrument has also achieved some distinction as the author of "Defective Sight and its Optical Correction"—a useful and instructive treatise on the eyes and spectacles. This little work was originally intended for the benefit of the public, but being submitted in manuscript to the editor of this journal, a substantial sum was offered for the privilege of first publishing as a serial article in the journal. It has since been reprinted and largely circulated in a convenient pamphlet form, and a few more copies of the reprint are still to be obtained gratis from Messrs. Botwright and Grey, upon application. It is written in a most entertaining style, and contains a deal of information regarding sight-testing, and should be read by every optician. This house have a number of specialities in interchangeable spectacles and eye-glasses, which for convenience in fitting all forms of simple vision on the spot have attained a firm hold upon the market; the system is one of their own introduction, and can be depended upon for accuracy. A most important feature in this business is the execution of all spectacle and eyeglass repairs—making odd frames specially to measure by return of post. They have a large staff of skilled workmen and apprentices (who have received awards at various exhibitions), and judging from the immense number of packages sent out daily by post, their efforts to place country customers in the way of getting optical work done promptly and cheaply shows it is appreciated. The system has been in operation nearly eight years, and continual additions to the staff is necessary to keep pace with the work received. In addition, for customers, only special errors of vision, such as astigmatism, are tested and corrected by one of the partners on Tuesdays and Thursdays, between the hours of 11 and 1. Many persons are thus saved the inconvenience and expense of going to ophthalmic surgeons, and where only an error of refraction has to be corrected, no better assistance can be sought. This advantage, we believe, is offered by no other wholesale house. By this arrangement every form of vision can be corrected, and the optician still keeps the customer and transaction in his hands. They also offer to any one of their customers instruction, either personally or by letter, in sight testing and the use of cylindrical glasses in correcting astigmatism, etc.



Grandfather's Clocks are still in demand, and several report they are busy in them.

Messrs. F. Barker and Son, of 12, Clerkenwell-road, London, E.C., so intimately associated with the compass trade, and with all sorts of useful and ingenious accessories, have made a new and invaluable addition of a very simple nature, by which all compasses are transformed to sun dials without the usual awkwardness and cumbersomness of those which formerly served those purposes by an angular gnomon. Briefly described, in the inner ring of the moving dial are the points of the compass; on the outer, the hours from four in the morning to eight at night are indicated as on the ordinary sun dial; a line stretches across the frame, which, upon pointing to the sun, casts a shadow upon the figure corresponding with the time of day. We should think that few compasses in the future will be made without this simple and valuable addition.



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Turning to Birmingham, the trade upon the whole is certainly more cheering. Here and there a little complaining is heard, but by far the greater proportion of the reports are satisfactory.

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Messrs. Mayer Blanckensee have just brought out a new series of coloured fischus, and added more to their specialities of fancy diamond rings and brooches. They find trade improving.

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Messrs. Bragg are fairly occupied; amongst other things they have several fine presentation keys on hand—one for the New Law Courts, West Bromwich (to be opened in April), is a very large and elaborate piece of work. They also supply us with an interesting description of a mayoral chain and badge for Bishop's Castle, just supplied by them.

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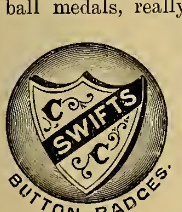
Mr. W. J. Dingley is also fully occupied, and has sufficient orders in hand to keep him so for the next two months, which also confirms a remark made by another house in last month's number, that the demand for badges and medals is on the increase.

* * *

Messrs. Vaughton, of the Gothic Works, report trade brisk. They are making a lot of fine new things in football medals, really artistic bits of work, with enamelled arms, carved ornaments, chased and embossed work introduced into them. Also a lot of novelties in cycling club badges and medals, and small button badges. The wood block will serve to keep what this firm is doing before our eyes. They have fitted up a designing and modelling office, and are prepared to furnish designs and models of any article in the trade, and have engaged Mr. H. J. Bates (late designer for Messrs. T. and J. Bragg) to preside over this department.



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Mr. A. Sydenham, Frederick-street, reports medal orders are rolling in splendidly this season, and in order to keep up his reputation for these goods he has arranged to keep a very large stock this year. Having done so very well with diamond spray and diamond and gem butterfly and bird brooches, he intends to give much more attention to this department in future. He has also arranged to keep a very large stock of all sorts of gold Waltham watches for gentlemen and ladies, also silver Waltham watches.

Messrs. G. E. Walton and Co., Hylton-street, are busy with novelties in brass and wood English clocks; some of the latter are elaborately got up and ornamented in Japanese art style.

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The business till lately carried on by Mr. Thomas Adams, Hockley-street, is now being carried on by Mr. T. H. Adams, junr., who is hoping to retain all his father's old customers and to obtain as many more new ones as possible.

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Mr. Colin Cheshire, Northampton-street, whose well-made novelties in small silver ware are well known to the wholesale trade, is still engaged in the production of new ones.

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Messrs. J. Goode and Sons have not yet finished their new catalogue, but have got it in a forward state.

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Mr. F. Derry, Hockley-street, have just issued two illustrated books of prices which are bringing fair returns.

* * *

Turning to Sheffield, we find a very fair report considering all things, the McKinley tariff included.

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Messrs. Edwin Blyde and Co., Sheffield, are fairly employed in table cutlery of better class for home trade; cased goods, fish carvers, fish eating knives and desserts. Although this being the quiet time of the year they hear of many complaints. The firm are especially busy in imitation ivory table goods, the latest improvement in Xylonite being in fair demand. Messrs. Blyde have secured the provisional patent for the new table cutlery with improved bolster to prevent shrinkage, and are expecting a large sale as soon as they can get them fairly on the market.

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Messrs. M. Willis and Son, Exchange Works, who took Mr. William Willis into partnership in the opening of this year, report they are very busy with orders from England, Ireland and Scotland.

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Turning to Coventry, we are pleased to hear satisfaction expressed nearly all round.

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Messrs. Newsome and Co., Coventry, report trade continues fairly good, with a growing demand for better qualities. A great many high-class watches have been sold since Christmas, and these watches are being made in larger numbers than ever in Coventry. The Kew Observatory's certificate is becoming better known, and the output in goods that have gained the certificate is steadily increasing, and is only limited by the number of really capable adjusters.

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Turning to Prescott we find the recent case of Gore v. Carley has had the effect of causing the watchmakers to take greater interest in their Watch Trade Association, resulting in a considerable increase in its members.

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Messrs. Isaac Hunt and Co. are just completing extensive alterations in their factory with a view to putting down further machinery, which their incoming of orders suggests necessary.

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Messrs. F. Williams and Co. find an increasing demand amongst country watchmakers for English-made tools to the exclusion of the Swiss.

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

(*Continued from page* 200.)

The Dimetric System.

The Natural Forms of Zircon.

IN a previous chapter we explained that the names of the six systems of crystallography were derived from the relative lengths and positions of the axis — certain imaginary lines that are supposed to run through the crystal in various directions crossing in its centre. In the isometric system these were all of the same length, in this they are of two lengths; hence its name dimetric—two-measure. The typical form is a prism with parallel sides upon a square base; the axis along the length of the prism is called the principal, and the two connecting its opposite sides the lateral axis. Fig. 28 shows this figure with its axis, also a double pyramid of the same order inscribed around the same axis. It will be noticed that the principal axis joins the two basal extremities of the prism, and the apices of the pyramid, which is always the case. In this instance the lateral axis join the centres of the opposite faces of the prism, the centres of the edges of the double pyramid, when they are called a prism and pyramid of the second order. There are also seen two dotted lines connecting the lateral edges of the prism, and the solid lateral angles of the pyramid, representing the relation of the axis in prisms and pyramids of the first order. It is thus seen that in this system the figures are prisms and pyramids; a prism may be terminated either singly or doubly, with a pyramid or pyramids; and, further, the pyramids may be of different degrees of acuteness, or may go up, as it were, in steps of various degrees of acuteness, or, more properly speaking, at various angles to the principal axis, and so alter its length. Before me is a crystal of Zircon, with five such steps. Fig. 29 shows a very common and simple form of Zircon: when thus doubly terminated they are of necessity single, but they may occur in groups with their bases attached and only one end free, which may then be terminated either by a simple low pyramid, or it may go up at two or more different angles as in the figure. Although no gem enjoys a greater hue-suite than this, so far as I have been able to observe no special form characterises either of the varieties of this gem.

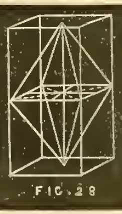


FIG. 28

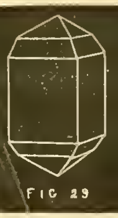


FIG 29

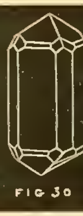


FIG 30

Fig. 29 is a hyacinth in my collection, the same forms being represented by jacinths, various shades of browns, greens, and blues, the same colours taking different complications in other specimens. Fig. 30 introduces us to some new complications; firstly, we notice our prism is no longer four-sided, but has put on four more faces truncating the angles of the first prism, and at right angles to the second pair of lateral axis, and, therefore, of another order. We thus get an eight-sided prism which is a combination of the prisms of the first and second orders. Turning our eye to the pyramids, we notice both their zones of facets follow in the same vertical zone as the larger developed prismatic face, and are consequently of the same order; but we find that no such relation holds good with the prismatic faces of the other order, and the pyramidal faces by which they are followed; but on the other hand we find them followed by *pairs* of faces, which, from the way they meet, it is evident they both stand at an angle to them, so that upon the prism of that order they would form two distinct faces, which, if developed to the extinction of the other planes, would produce another eight-sided prism, bearing altogether different relations to the axis from the other two prisms; this form is called the di-tetragonal. In this specimen there are no di-tetragonal prismatic faces, but di-tetragonal pyramidal only. Specimens now before me, but which, of course, it is impossible to illustrate, show these pyramidal faces very much more developed than the prismatic; in one specimen the first and second order prisms are represented by faces of about a quarter and a half inch respectively, followed by di-tetragonal pyramidal fully-developed, nearly half-an-inch long, then alternately faceted by faces of the first and second order pyramids, making the crystal quite egg shape; whenever these di-tetragonal pyramidal faces are present with the two orders of prisms, they always make the latter six-sided in outline; if the prisms are equally developed, the hexagons are the same size and shape; if not, the smaller only is elongated vertically. In some instances the prismatic faces are almost or quite wanting when they form low octahedra, nearly twice as wide as high. The lowness of the pyramid in this species makes it often approach complications of the isometric system, when the prismatic faces are short, often looking very like combinations of the rhombic-dodecahedron at their upper or lower sides; moreover, there is frequently a very resinous garnety look about Zircons which call for special attention in recognising the complicated forms.

The Zircon frequently occurs as twins especially of the simple forms, joined by their pyramidal faces into a kind of L-shape. This latter feature is at once distinctive. I have no doubt some will think all this detail of the relations of the faces to the imaginary axis is quite superfluous; but when we come to study the optical properties of gems we shall find it is absolutely indispensable.

(*To be continued.*)

The Merchandise Marks Bill was read a second time in the House of Commons on the 23rd ult.

A new clock with three dials and chimes, the work of Mr. J. W. Benson, Ludgate-hill, has been placed in the tower of Faversham Church.

Robert McInnes, wholesale jeweller, was sentenced at Glasgow to nine months' imprisonment for having, within four months of his sequestration, pledged jewellery to the value of £320, which he had obtained on credit from firms in London and Brighton.

The Merchandise Marks Act: Important Conference.

UNDER the auspices of the Watch Trade Section of the London Chamber of Commerce an influential meeting of the trade was held on March 3rd at Botolph House, Eastcheap, E.C. The primary object of the conference was to consider how watches, having portions of the movement made in a foreign country, should in the opinion of the trade be marked so as to establish a recognised custom of the trade, which shall be in compliance with the Merchandise Marks Act as laid down in the case of Gore *v.* Carley. Mr. H. M. Frodsham (Strand) presided over an extremely large attendance, which included Messrs. J. W. Benson, John Walker, Russell, Gooding, D. Buckney, Golay, Cole (Usher and Cole), Hewitt, Webster, J. Tripplin, S. W. Vine, J. S. Stockall, R. Haswell, J. A. Clémence, H. B. Isaac, E. Cohen, Chas. Dunn, D. Glasgow, S. E. Nielson, Webster, J. U. Poole, C. Bacon, C. Heap, Hill, Yeoman, L. Allamand, Richards, G. Cornioley, Lund (Broad and Lund), Brookes, Cashmore, and Rogers; also Mr. Musgrave, assistant secretary to the London Chamber of Commerce.

The Chairman, in opening the proceedings, said the object of the meeting was to direct attention to the decision of the magistrate in the prosecution "Gore *v.* Carley," and to emphasise that decision in case there should be any traders who did not mark watches as they should be marked in order to legally carry out the Merchandise Marks Act. The desire of the London Chamber of Commerce was to do everything in its power to promote and encourage the English trade; and it was thought best to call that meeting in order to urge upon all manufacturers and retailers to cheerfully comply with the Act. The only way in which this could be done, until such movements as they did not make themselves at present were made in Clerkenwell, was to mark on those movements what parts were made in England and what parts were made abroad. In any case, it was to be taken for granted that no one would use more than he could possibly help of foreign work. Everything which could be made in England, and bought there, must be used, and only such portions as they did not make themselves, and could not make, must be put into a watch; and it was for the meeting to decide upon the mark to be used, which must include the name of the place where the rough movement was made. As regarded ordinary work, he took it for granted that no one would use the foreign movement to make up an ordinary watch because there was no occasion for that now; it would only be in the case of complicated work that such movement would be required. The Act at first looked as though it was somewhat Protectionist; but on reading it carefully they would find it was not so; its intention was simply to give to each person the credit which belonged to him. There must be no attempt to describe work as English or foreign which was not so. It was for the meeting to agree upon some words which should be used by all the trade to mark watches in those parts which were foreign. The marks must include the name of the place in which the part was made—in other words, Switzerland. The Act was clear, and the decision of the magistrate in the case of "Gore *v.* Carley" emphatically confirmed its intention.

In answer to a question put, the Chairman said the meeting could not go behind the decision referred to. It was law, and must be accepted as final, since the parties interested had not appealed.

Mr. Vine observed that it appeared to him that the question the meeting had to decide had almost as many complications as the complicated movement itself. (Hear, hear.) To his mind it would be very difficult to describe on the top plate of a watch how many parts were made in Switzerland, and what work was done in England. If the whole of the works of the watch were described as "Swiss movement finished in England," it would give but a very vague idea of how much work had been done in this country; and to engrave on the plate such words as "Swiss, keyless, and motion works completed in England," would be objectionable to shopkeepers in selling the watch. That objection the trade would have to put up with, because they themselves would be in a serious position if they were to sanction the suggestion that the whole of the works were completely made in England. It was impossible to get the complicated movement made in England. He suggested, therefore, that the meeting should formulate some idea to lay before counsel, in order that they might protect themselves, and observe strictly the spirit of the Merchandise Marks Act.

The Chairman thought the meeting might fix on some general term, such as "Partly Swiss—rough movement," or "Swiss foundation," to designate a watch made partly in England and partly abroad. Of course if they agreed to adopt the former term it would not necessarily imply that ninety per cent. of the works were made in Switzerland and ten per cent. here. It must be understood that whatever term was adopted the trade used the minimum of foreign movement.

Mr. Glasgow said the Chairman was inclined to consider the provisions of the Merchandise Marks Act as being simple. His impression was that they were exceedingly complicated. Neither could he accept the magistrate's decision in "Gore v. Carley" as final. He did not think the decision was right. Before the meeting could pass any resolution that would be likely to prove of service to the trade, the best counsel ought to be consulted as to the proper interpretation of the Merchandise Marks Act.

The Chairman reiterated the opinion that the magistrate's decision must be taken as law. The tendency of the Act, he added, was quite clear.

Mr. Glasgow said the decision, like the Act itself, was not clear, and the trade ought accordingly to take the opinion of eminent counsel.

The Chairman ruled Mr. Glasgow out of order. He could not admit any discussion on the magisterial decision; it must be taken as law.

Mr. Glasgow inquired if he could move that counsel should be retained.

The Chairman replied in the negative.

Mr. Poole proposed "That in the opinion of this meeting, manufacturers, for their own protection in making up a watch composed partly of English and partly of foreign materials, should engrave the words 'part Swiss' on the plate as the custom of the trade." He considered the qualification suggested would be ample, even if the materials used were in the proportion 19-20ths English and 1-20th Swiss; he meant, of course, the proportion to apply simply to the movement, to the exclusion of the case.

Mr. Tripplin, in seconding the proposition, said that the description "part Swiss" would amply meet the case.

Mr. Richards remarked that he had travelled with others from Coventry, and was anxious to inform the meeting that at a conference of the watch trades associations, held on the previous day, and at which representatives were present from London, Liverpool, Prescot, and Coventry, it was resolved that it was undesirable that any special system of marking watches not wholly made in England should be adopted as suggested by the London Chamber of Commerce. (Laughter.)

In reply to a querist, Mr. Richards said the Coventry meeting was composed of representative watch manufacturers. He (Mr. Richards) was not speaking as a representative of the London watch trade.

Mr. Hewitt considered the clauses of the Merchandise

Marks Act were sufficiently explicit, and he suggested that a resolution should be passed approving the watch clauses, and admitting the benefit they had been to the trade. (Much laughter.) He protested against any foreign movement being admitted into an English hall-marked case.

Mr. Cornioley asserted with some emphasis that the working of the Merchandise Marks Act was putting the English manufacturers into a corner. ("No, no.") The resolution was not comprehensive, and would not define properly the position of the manufacturer. If the latter were obliged to put a foreign mainspring in his watch, and was obliged to mark it "part Swiss," it would put him in a very disadvantageous position. Did the meeting wish to suspend English manufacture until makers were able to supply all parts that are now imported from Switzerland? He did not consider notice would be taken of such small matters as that.

The Chairman said the desire was that the minimum amount of foreign movements should be imported.

Mr. Cornioley created some laughter by asking the value of "minimum." In passing such a resolution, the trade would be cutting their own throats for the time being. He knew something about foreign materials used in English watches, and was not aware that an English watch could be manufactured without it. The English watch trade was not sufficiently organised to take effective action. What were they going to do? ("Organise.") What till then? (A voice: "Starve," and much laughter.)

The Chairman, referring to Mr. Cornioley's remarks, said he would not admit that one chronometer sold by his firm existed that had not an English foundation. (Hear, hear.)

Mr. Clémence said traders had only to act in accord with the spirit of the Act, and they would be sufficiently protected.

Mr. S. A. Brookes took exception to the statement that an English watch could not be made without the assistance of imported works. He did not wish it to go forth to the world that complicated work in watches could not be made in this country, for there were already two places where such work was done in England.

The Chairman: Yes, but they will not sell to the trade. These complicated movements cannot be obtained as suggested at present. I must make it clear that we can't decide anything legally. I presume at the same time that everyone is loyally endeavouring to carry out the spirit of the Merchandise Marks Act, and that he is not using anything of foreign make more than he is absolutely obliged. (Hear, hear.)

Mr. Vine then proposed the following amendment to the resolution:—"That, in the opinion of this meeting, no marking of watch movements composed of foreign and English materials will accurately describe what proportion is foreign and what English, and this meeting therefore leaves it to manufacturers to exercise their own judgment in conforming to the Merchandise Marks Act." He had studied the Act, and could not understand how a watch could be accurately described so as to satisfy the trade and the purchaser. The latter had a right to know what parts were Swiss and what English. (Hear, hear.) The meeting was in another difficulty, for whatever was decided there, would have no binding effect on either magistrate or judge. There was no difficulty, however, in conforming to the Act and marking the works of a watch, so as to indicate what was English and what foreign. Was it to be understood that a desire existed to mislead the public? ("No, no.") If there was the slightest attempt in that direction he should be the first to put his foot down. He thought after all there was, on the part of some manufacturers, a fear in boldly speaking the truth. (Hear, hear.) Still, it was impossible for that meeting to determine upon a marking that would be intelligible and accurate, and protect them from prosecution.

Mr. Lund, in seconding the amendment, pointed out in regard to the complicated movement there were three distinct grades of movement well known in the trade, and which it would be unfair to designate by a common mark. Personally, he always acquainted his customer with the difference between English and foreign movements contained in a watch, and he urged that the manufacturer must, in every instance, observe the greatest rectitude in his dealings with his customer.

Mr. Isaacs said the meeting could not pass a resolution that would be satisfactory and binding upon the trade. What the trade should do was to combine and determine upon a principle that would protect manufacturers and the public generally. Although he had taken some interest in the Trade Protection Society, he could not help thinking the latter had acted with a certain amount of hardness to some people in directing their prosecution. (Hear, hear.) He was one of those who would advise the Society to temper their judgments and prosecutions with a little mercy and discretion. If the Society did not, they could not expect the support of the outside public, neither would the leading persons connected with the Society prosper. (Hear, hear.)

The amendment on being put was carried by 18 votes against 10 for the original resolution.

Mr. Lund said they had arrived at a resolution which no doubt would be unsatisfactory to many. He was anxious, however, that the matter should be thrashed out. He moved therefore—"That the Watch Trade Section of the London Chamber of Commerce be requested to consider the desirability of proposing an amendment to the Bill for Amending the Merchandise Marks Acts, which will be introduced by the Board of Trade, in order to define more clearly the obligations of the watch trade under the Merchandise Marks Act."

Mr. Glasgow seconded the motion. The Act, he said, had been troublesome to most of them, and very indefinite.

Mr. Cornioley suggested that a certain number of gentlemen in the room, who were not members of the Chamber, should be added to the committee, to give effect to the resolution.

Mr. Brookes said, although the meeting represented a multitude of counsellors, they had not wisdom enough to get out of the difficulty. He argued that if the larger number of counsellors could not get out of the difficulty, a smaller number, represented by the committee, would not. The whole secret of the Merchandise Marks Act was that the public must be supplied with what they asked for. Why did not the manufacturers rise up in London and make the complicated works which were imported? He was surprised that even some of his foreign friends had not established a factory in this country.

Mr. Musgrave intimated that the President of the Board of Trade had given notice to introduce a Bill to Amend the Merchandise Marks Act. The duty of the committee would be to examine the Bill, and to suggest what could be done to define the position of the English Watch Trade.

The resolution was agreed to.

On the motion of Mr. Cornioley, seconded by Mr. Clémence, it was decided that the following gentlemen should form a committee to co-operate with the watch trade section to give effect to the resolutions:—Messrs. Lund, Russell, Neilson, Hewitt, Isaacs, Glasgow, Cole, Gooding, J. Walker, Golay, Webster, Stockall, Heap, Dunn, C. Bacon, Cashmore, Rogers, Buckney, Yeoman (Coventry), Hill (Mayor of Coventry), and Adams (Coventry).

The proceedings concluded with a vote of thanks to Mr. Frodsham for his conduct in the chair.

* * *

In our last month's description of the Worthing Insignia, the motto should have been "*Ex terra copiam, e mari salutem.*"

Hall-marking of Silver Plate, with Special Reference to India.

A Paper read before the Society of Arts, January 22nd, 1891.

By Edward J. Watherston.

THE year 1890 marked a new era for the trade of the silversmith. The plate duties, unanimously condemned by a Select Committee, a Royal Commission, and by successive Chancellors of the Exchequer, were at last abolished, and although a year has not yet elapsed, the beneficent effect of the reform is apparent to, and freely acknowledged by, all engaged in the trade. Not only has the volume of trade increased enormously, as can be testified to by the various assay offices, but already marked improvements in design and workmanship are observable. Workmen are in full employ, wages have risen, and the trades which mainly rely upon the silver trade, such as engravers, plate-chest makers and others, have participated in the general prosperity. The output of British silversmiths, during the period from 1876 to 1890, averaged 793,336 ounces per annum. It may fairly be expected that this amount will be more than double in the current year. All goes to prove, if proof were wanting, that there is no enemy to commerce so great as the exciseman, and no surer means whereby to dwarf enterprise than by imposing a tax upon manufactures.

It will be well first to consider the position of the British trade at present affected by legislation. I shall next proceed to show the position of the trade in foreign countries as affecting that of the United Kingdom; and lastly, I shall plead for a thorough reform of our national system of Hall-marking.

The United Kingdom.

By the abolition of the plate duties, the Hall-marking laws are now, practically, in the same condition as they were in the year 1784, the birth year of the duties, subsequent legislation being mainly of an amending character, abolishing the death penalty, and substituting other and less arbitrary punishments for offences, providing for the Hall-marking of gold wares of low standards, etc., the principal governing enactments being now the Statutes 12 Geo. II., c. 26, and 7 and 8 Vic., c. 22. But practically the law with regard to silver is the same as in 1784, and therefore but little differing from that of 1327, the date of the first charter granted to the Goldsmiths' Company, which, again, differed but little from the Act of 1300, 28 Edw. I., c. 20, commonly called "Articuli super cartas," which enacted that "no plate whatsoever should be made of a lower quality than standard (money), and that no vessel of silver depart out of the hands of the workers until it be assayed by the wardens of the craft, and marked with the leopard's head, the said wardens being empowered to go from shop to shop among the goldsmiths, and to seize in the king's name any gold wares below the 'touch' of Paris."

The exportation of plate (treasure) of gold or silver was, at that time, and for centuries after, a capital offence, without benefit of clergy. For our present purpose very little need be said about gold plate, which is but rarely made; occasionally a snuff-box or presentation casket. Jewellery (gold and silver) is practically free, under a voluntary system of marking, at a very trifling expense. Plain gold rings are liable. Any novelty not specially mentioned in lists of exemption, 12 Geo. II., c. 26, and 30 Geo. III., c. 31, is liable. Enterprise is therefore checked accordingly. But, confining myself to plate (*i.e.*, unexempted wares), gold or silver, nothing whatever may be manufactured, either for home use or for exportation, below the authorised standards—of gold there are five, of silver there are two—and everything must be Hall-marked, either by the Goldsmiths' Company of London, or by one of the assay offices legally appointed. The Goldsmiths' Company, as has been shown, was incorporated in 1327. The assay office of Edinburgh is a very ancient institution, under charter of James VII., granted in 1687, which confirmed a previous enactment of James VI. The celebrated George Heriot was a deacon of the craft in 1591. The Glasgow assay office was established in the reign of George III. Charles II., by charter, incorporated the Goldsmiths' Company of Dublin. York, Newcastle, Lincoln, Norwich, Bristol, Salisbury, and Coventry were appointed by Henry VI., which powers were confirmed to York, Exeter, Bristol, Chester, and Norwich by William III., and to Newcastle by Queen Anne. Birmingham and Sheffield were added by George III.

Some of these have ceased to exist. Some others are said to be on their last legs, the amount of business transacted not being enough to cover expenses, now that the duties are abolished, upon which they used to have a commission—1 per cent. in England, 2½ per cent. in Scotland, and 5 per cent. in Ireland. Norwich, Bristol, Exeter, and Newcastle have long since given up. It is difficult to see how Edinburgh, Glasgow, and Dublin can pay expenses; so that unless the Government undertake responsibility—a proceeding very unlikely to commend itself to the House of Commons—there remain only London, Birmingham, Sheffield, and Chester at which ere long Hall-marking facilities will be available. That Hall-marking must be a self-supporting institution, or must cease to exist, is, I suppose, unquestionable. On the other hand, that manufacturers of plate in Scotland and Ireland should be handicapped by the compulsory inconvenience, delay, and expense of sending their productions to England to be marked, would be impolitic in the extreme. Both countries in the past have been remarkable for silver work, as may be seen in collections of antique plate at home and abroad. The decadence of the art in Ireland may be due, in some measure, to the poverty unhappily prevailing, but I am convinced that it commenced as a result of taxation, and that under freedom a revival of the art is not only possible but highly probable. At all events, an absence of marking facilities would seem to present a strong argument in favour of a voluntary system for those countries. The substitution of a "trade mark," protected as it would be under the Merchandise Marks Act, on the part of manufacturers, together with a stamp "Sterling—925/1,000ths," as in America, would answer all the purpose. There is but one alternative, viz., for the English assay offices to adopt the principle of "the touch" in place of "the scrape and parting assay," in the case of finished goods, of which hereafter. Manufacturers could also, if they liked, place Scotch or Irish emblems upon their goods, further to denote the locality of manufacture. One condition I hold to be essential for the trade, viz., that nothing shall prevent it being carried on in any part of Her Majesty's dominions, and I see no distinction whatever between plate and jewellery; if jewellery be free, so ought plate to be free.

India.

Passing to foreign countries, I take India first, as being the subject of most interest to members of this section of the Society of Arts, a society which I always like to call by its full name—"The Society for the Encouragement of Arts, Manufactures, and Commerce." I have a great belief in British commerce, viz., our trade relations with foreign countries. The influence of this society is, to my mind, never better exercised than in encouraging those relations, more especially with our colonies and dependencies.

It is most important that it should be thoroughly understood in India that there is now freedom of trade in all wares composed of the precious metals, as between that country and the United Kingdom. The same may be said with regard to all Oriental countries, and in point of fact to all countries, Oriental or Occidental, if, in the case of plate, wares be of "Oriental" design. It cannot, however, be denied that India still has to contend with certain disadvantages. In the first place, buyers in this country attach great importance to the Hall-mark. Its absence is suggestive of doubts as to quality. Secondly, India plate, as a rule, is of rupee standard—·916—and thus it cannot be marked in this country without an alteration of law. Thirdly, if it be of standard quality—·925—or if the law be altered, instituting a new standard for foreign plate, say ·900 (fully to allow for solder), it cannot be marked, excepting under the system of the "scrape and parting assay," a process which, especially in the case of Indian plate, is fatal to the finish of goods, involving a return to a workshop inevitable.

There is a strong argument against the introduction of a new standard, granting the dignity of a Hall-mark to plate below that of the United Kingdom, but the objection is not insuperable; it has already been done in the case of gold, which can now be marked of 9, 12, and 15, as well as of 18 and 22 carats fineness. There is, therefore, no logical objection to the introduction of a lower standard in the case of silver. The objection may be said to be sentimental rather than practical. Most Continental countries have a standard of ·900; many, indeed, France for example, marking ·800; Spain even ·738.

If it be held to be necessary, in the interests of India, to alter the law, it would appear to be desirable that it should be done at once; but such alteration must be accompanied by the introduction of the "touch," in place of the "scrape and parting assay," under a voluntary system, as provided be the Revenue Act of 1884. It may be well to state that I have had experience of marking by the "touch" in Paris and Vienna. Finished goods are marked, in a few minutes, without the smallest possible injury to work, however elaborate. It is much to be regretted that Goldsmiths' Hall has not long ago taken steps legally to adopt a similar system.

(To be continued.)

Siamese Rubies and Sapphires.

A DAY or two after the announcement of Sir Lepel Griffin of the unsatisfactory result of the Burmah Ruby Mines, a company was attempted to be floated to work the mines in Siam, and, although great concessions had really been made by the Siamese Government, and the sapphires and rubies were absolutely known to exist, the company for some reasons did not float. However, one of the gentlemen who were the instruments through which the concessions were originally made has now gone out again on some business with the Siamese Court, and no doubt some other little promised concessions will be made, and the company will be floated. From what we know by the experience of past years, we should not hesitate taking shares in it, although we were never tempted by the unknown lottery of Burma. The following is an interesting account of the Siam gem district:—

The region in which gems, including rubies and sapphires have for the past ten years been found, lies situated on the western side of the Cambodian peninsula, about 240 miles south-east of Bangkok, and covers, approximately, an area of 100 square miles. The centre of that district is Chantabun, a seaport with a good harbour, connected with Bangkok by a line of three small steamers running at regular intervals. It is stated in a recent report to the Foreign-office, that within three hours walk from Bangkok, to the north-west, is Ban Kacha, where rubies of a very inferior kind are still sought after by the local inhabitants, both Siamese and Chinese. Tongsoos, or natives of Pegu, and Burmese do not work there. Again, twelve hours distant from Chantabun, are the mines of Müang Krung, with a mining population of about 100 in all, mostly Tongsoos, with a few native Siamese and Chinese. Two days journey from Chantabun, in a southerly direction, is the district of Krat, with mines from which rubies are extracted, and but few sapphires. The Tongsoo workers there number about 3,000. On the eastern side of the hill range, and three days journey due east from Chantabun, midway between that town and Battambong, are the Phailin mines, the most extensive and most frequented of all. Here there are between 4,000 and 5,000 gem seekers. Rubies and sapphires are both found, the latter being more abundant. The rubies at these diggings, although more rarely met with, are said to be of higher value than those discovered at other places in Siam. A stream which rises in the hill ranges passes through the neighbourhood of the mines on its way to the Thale Sap and the Cambodia River. All three of these localities—Krung, Krat, and Phailin—have been, or shortly will be, conceded on mining leases. The method of obtaining the precious stones is identical at all the diggings in the region of Bangkok, and is as follows:—The intending digger, on entering the district, pays three ticals (5s. 3d.) to the headman, a Burmese British subject appointed by the British Legation, and responsible to the governors of Battambong and Chantabun, according as the fees received are derived from the Phailin or Krat Mines. Beyond this tax there is no further fee exacted. The Siamese Government claim no right to pre-empt gems found, or to purchase at market value all stones above a certain carat weight, as was the case in Burmah. The Tongsoo digger's first object is to discover a layer of soft, yellowish sand, in which both rubies and sapphires are deposited. This stratum lies at depths varying from a few inches to twenty feet on a bed of subsoil, on which no precious stones are found. A pit is dug until this corundum is exhausted, and the soil removed is then taken to a neighbouring canal or stream, one of which runs in the proximity of the mines, both at Phailin and Krat, where it is mixed with water, and passed through an ordinary hand-sieve. In his search for this peculiar alluvial deposit, which is generally free from any admixture of clayey earth, the digger has often to penetrate into the jungle that grows thickly around, and combining the work of clearing with the occupation of gem digging. The Tongsoos do not appear to form themselves into companies for mutual assistance or division of profits. They work principally in twos and threes, and if chance lead them to discover a gem of any value, they either undertake a sea voyage to Rangoon or Calcutta for the purpose of obtaining a good price for it themselves, with the dealers in precious stones at these places, or consign their acquisitions to an agent, while they themselves continue to search for more. A process of migration is continually going on amongst the Tongsoos of the different mines, the workers passing from one to the other, according to the reputation of a particular mine at certain periods. No artificial or mechanical processes for the washing of the soil have as yet been introduced, nor have gems been discovered in fissure veins of soft material embedded in crevices of hard rock, or in crystal form. Rubies and sapphires are found at all the diggings, often deposited side by side in the same layer or stratum of sand. The ruby of "pigeon's blood" colour is rarely met with. The colour of the Siam ruby is often light red of a dull hue; it is a little unfortunate that the term "Siam ruby" has grown to be a trade term for dark inferior stones, irrespective of the locality from which they come. Some Siam rubies are the finest the world has ever produced. The sapphire is usually of a dark, dull blue, without any of the silken gloss which is the distinctive mark of the Burmah and Ceylon stone. Stones resembling garnets rather than rubies are found in the dried beds of watercourses at Raheng, two hundred miles north of Bangkok; these are the so-called Siam rubies of commerce, and there is every reason to believe that rubies also equal, if not superior, to those discovered in the south-east, exist throughout the Raheng district. Those hitherto obtained are the result merely of surface scratchings by Tongsoo seekers.

*

Trial of Chronometers at the Royal Observatory, Greenwich, in 1891.

THE annual trial of chronometers at the Royal Observatory, Greenwich, will commence this year on July 4th, and will be for a period of twenty-nine weeks. The chronometers will be tested in the oven for two periods of four weeks each, at temperatures ranging from 75deg. to 100deg. Fahrenheit, and also at the ordinary summer and winter temperatures of the room.

Application for permission to send chronometers for trial must be made to the Hydrographer of the Navy, Admiralty, London, S.W., not later than Monday, June 15th, and no chronometer can be received at the Royal Observatory later than Monday, June 29th.

Trial of Deck Watches.

A trial of deck watches in two classes, A and B, will take place at the Royal Observatory, Greenwich, this year. Class A watches should be of good finish, full jewelled, with sunk seconds dial, and fine Bregnet spring, and well adjusted in compensation and positions. Class B watches should be strongly made, of less expensive workmanship, and adjusted for compensation and horizontal and vertical positions.

Makers who may desire to send watches to this trial must first obtain permission from the Hydrographer of the Navy, Admiralty, London, S.W., to whom all such requests for such permission must be sent not later than October 5th, stating the class for which each watch is to be entered.

The watches are to be deposited at the Royal Observatory between the hours of 10 and 1 on any day (excepting Sunday) during the week ending with Monday, October 19th, after which date no watch can under any circumstances be received.

The rating this year commences on Saturday, October 24th, and will be as follows:—

	Class A.	Class B.
Watch, horizontal, dial up, in room for	6 weeks.	6 weeks.
,, ,, ,, in oven for	1 week.	1 week.
,, vertical, pendant up ,,	4 days.	1 ,,
,, ,, ,, right ,,	3 ,,	Not tried with pendant right or left.
,, ,, ,, left ,,	3 ,,	
,, ,, ,, up ,,	4 ,,	
,, horizontal, dial up ,,	1 week.	1 week.
,, ,, ,, in room for	6 weeks.	6 weeks.
Total duration of trial	16 ,,	15 ,,

The mean temperature in the oven will be from 80deg. to 85deg. Fahrenheit. The watches are to be in strong dome silver cases, with crystal glass, and each must bear a distinguishing number engraved on the plate of the movement.

After the termination of the trial, the Admiralty will offer to purchase as many of the best watches in each class as may seem desirable, at prices not exceeding £18 for class A, and £10 for class B. The price is to include a mahogany box with ivory label, cleaning after trial, and engraving the Government mark on the dial and plate of the movement, and the name of the maker, the number of the watch, the letters D.W., the Government mark, and the letter A or B on the ivory label of the box.

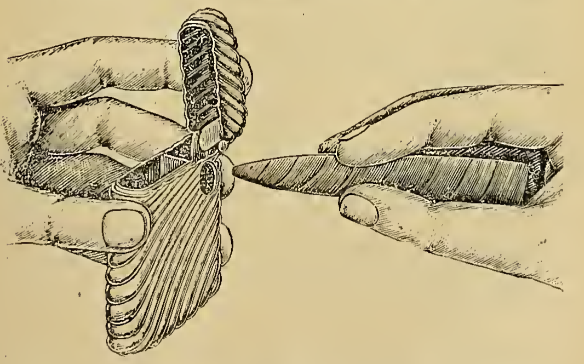
W. H. M. Christie,
Astronomer Royal.

Royal Observatory, Greenwich,
March 18th, 1891.

Mayoral Chain for Ossett.

MR. FRED LAND, of Wakefield, Ossett, and Normanton, has just supplied a magnificent and valuable chain for the Mayor of Ossett, and it is, perhaps, one of the finest pieces of work of its sort. It weighs thirty-one ounces, and is made of 18ct. gold (Hall-marked). Each link forms the letter O, which stands for Ossett, and on the top of this is a mural crown for the emblem of superiority, and a shield on which will be engraved or enamelled the coat of arms of each succeeding mayor. These are fastened by two oblong rings, with a *fleur de lis* on each ring, which are works of art in themselves. The centrepiece is a beautifully wrought piece of work, having in the centre a shield on which is enamelled the present mayor's crest, which is carried out correctly according to the rules of heraldry, being a pair of wings in white on a blue black ground with other details too numerous to describe; round the border of this is enamelled in blue "Edward Clay, Esq., First Mayor of Ossett"; above the shield is a mural crown, and round the whole is a sprig enamelled green with red berries which flows right through the base, and above all is the Imperial Crown on an ermine cushion. On the right-hand side of the centrepiece is enamelled on the shield the coat of arms of Mr. Charles Milnes-Gaskell, the Member for the Division, which is so full of detail in such a small space that one needs a magnifying glass to decipher it; on the left-hand side the Yorkshire Arms contrast well—five lions in gold on a red cross with a white background. In the centre of the badge is an exact reproduction of the Borough seal which is to be, according to the design already accepted by the Committee of the Council, which represents the shoddy industry, agriculture, and the mining industries, and is surmounted in the centre by a golden fleece, for wealth, etc. There is also a diminutive mace and sceptre, the mace being an exact copy of the design accepted for the mace of the Borough. Entwined round these on either side hangs a piece of exquisitely-carved scroll work, which is most graceful in form, and gives the whole badge a light and chaste appearance. A ribbon stretches across from the handle of the mace to that of the sceptre, with the words "*Inutile utile ex arte*" engraved on it. At the bottom of the badge is another piece of scroll work, which gives a finishing touch to a most exquisite piece of work. The chain has been made by Messrs. Allen and Martin, one of the best known firms in Birmingham, and was designed by Mr. Chas. J. Wigley, the designer at that establishment.

We give an illustration of Messrs C. Timings and Son's New Patent Combination Match Box and Cigar

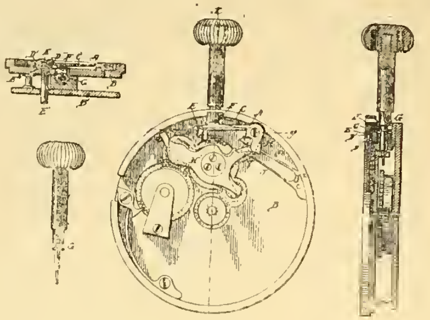


Cutter in "Aftean Silver," as described last month on page 206.

Illustrated Inventions Record.

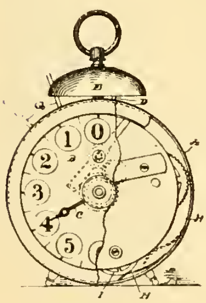
Stem Winding and Setting ch.—John Johnson, Baton Rouge, La.

In a stem winding and setting watch, the yoke and the key-pipe, in combination with a flexible lever constituting a direct connection between said yoke and key-pipe.



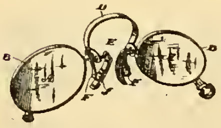
The combination of the yoke, the key-pipe, the bell-crank lever, and the spring-arm J J', one of said arms bearing against and actuating said yoke and the other arm bearing against and actuating the bell-crank lever.

Time-Alarm for Culinary Purposes.—William E. Groves, Boston, Mass.



An alarm mechanism provided with a stop-brake, or slide adapted to engage automatically with the periphery of the balance-wheel to stop its movement when the alarm has sounded and to be moved in a tangent therefrom by the operator, the latter movement serving to release and start the balance-wheel and to impart tension to the alarm-spring. The case A, with a suitably-actuated train of gearing, the indicator-hand C, alarm devices D E, and alarm-spring K, in combination with the curved slide H, connected to a lever protruding through the case whereby the slide may be disengaged from the periphery of the balance-wheel by the operator and engaged therewith by the action of the alarm-spring.

Eye glasses.—Henry E. Kirstein, Rochester, N. Y.



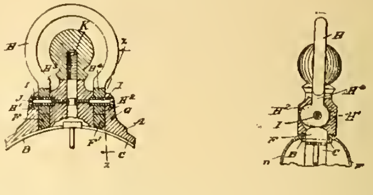
In an eye-glass, in combination, a clamp-post, an arm springing from the clamp-post, a nose-piece mounted free for rocking or adjusting movement upon the arm, the connection between the arm and the nose-piece being at the central portion of the latter so as to leave its extremities free, and a tongue springing from the nose-piece and adjustably engaged with, but free for limited movement with respect to a fixed clip.

Cleaning Spectacles, etc.—J. Everard, 27, Ladypool-road, Sparkbrook, Birmingham.

Two sheet metal discs a^1, a^2, connected by a spring band a^3 or hinge, are covered inside with felt, plush, or similar substance; the lens to be polished is rubbed between the two surfaces pressed together by the thumb and finger; a^4 is a catch for holding the parts closed when not in use. The details of construction may be slightly modified.

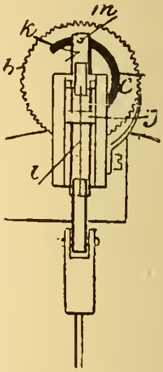
Watch-Case Pendant.—Duncan E. Grant, Quebec, Canada.

In combination with a watch-case and its lid or cover, a locking spring or catch and a pendant-bow adapted to act



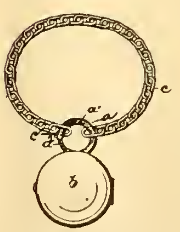
upon and to force back the spring or catch when moved to one side.

Pendulums.—W. T. Story, Market-place, Dewsbury, Yorkshire.



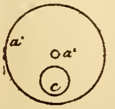
A split curb *j* attached to a sliding bar *k* can be shifted along the suspension spring *i* by means of a toothed wheel *h*, which has a spiral cam slot *c* engaging a pin *m* on the bar *k*. The wheel arbor has an index lever for a small dial at the top of the clock face. It may, however, be geared to a lever on the centre arbor, the graduations being confined to an arc.

Jewellery.—Ludwig J. Roehr, Newark, N.J.



A lock for bracelets and the like, comprising a locket or other ornament, a hollow split ring secured thereto and carrying a spring, and a locking bolt working in the split ring and engaging in a holding relation with a suitable seat, thereby closing the ring, the split ring being adapted to engage the opposite ends of a bracelet or necklace.

Method of making Watch-dials.—John Jacobson, Boston, Mass.



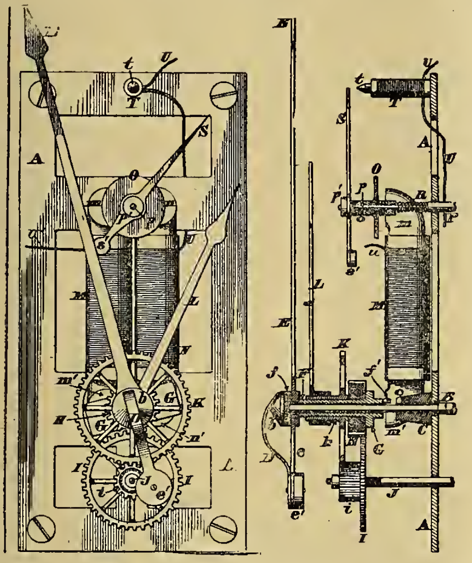
That improvement in the art or method of making watch-dials which consists in providing the metal base of the dial with a covering of enamel of uneven thickness but level surface, moulding the enamel by stamping and depressing the surface of the thicker portion, and baking the enamel. That improvement in the art or method of making watch-dials which consists in providing the metallic base of the dial with a covering of plastic enamel, baking the enamel, and stamping or pressing the same to the desired shape while heated.

Electric Hand-Setting Mechanism for Clocks.—

William W. Bradley and Willard N. Packer, Canton, Ohio.

1.—The combination, with a synchronizing-clock, of a magnet or a pair of magnets which, when charged, will first set the seconds-hand and then set the hour and minute hands.

2.—The combination, in a synchronizing-clock, of spindle P *p*, armature O *o*, mounted upon the shank *p* of said spindle, spring R, forcingsaid armature outwardly, a seconds-hand S, applied to said shank and clamped between the sleeve *o* and nut *p* and a magnet or magnets as M *m* N *n*, for retracting said armature.



3.—The combination, in a synchronizing clock, of the freely-swinging seconds-hand S and a magnet as T, for arresting the vibrations of said hand when released from its driving spindle.

* * *

APPLICATIONS FOR PATENTS.

(*Expressly compiled and contributed for this Journal by* Messrs. W. P. Thompson and Co., F.C.S. M's I.M.E., Patent Agents, 6, Bank-street, Manchester; 6, Lord-street, Liverpool; and 323, High Holborn, London, W.C.)

3,084.—H. E. Collett and F. E. Wright, Birmingham, "Converting any shape or design of brooch into or to be worn as a bracelet." 20th February, 1891.

3,446.—W. W. Horn, London (communicated by D. E. Grant, Canada), "Watch case pendant." 25th February, 1891.

3,372.—N. V. Esenbach, London, "Chronometers." 24th February, 1891.

3,650.—Leon Pope, London, "Electric clocks." 28th February, 1891.

3,255.—W. Townsend, London, "Studs and solitaires." 23rd February, 1891.

3,642.—J. C. W. Jeffreys, London, "Sleeve links, solitaires, etc." 28th February, 1891.

4,015.—A. E. J. Ball, Plymouth, "Brooch pin." 6th March, 1891.

3,800.—T. J. Annetts, Tottenham, "Solitaires, studs, links." 3rd March, 1891.

4,187.—Otto Tietze, Holborn, London, "Cases for jewellery, watches, etc." 9th March, 1891.

4,329.—H. H. Soar, London, "Watch and chain protector." 11th March, 1891.

4,392.—W. Entwisle, London, "Electrical bell and electrical alarm clock." 11th March, 1891.

4,576.—J. A. Macmeikan, Bucks, "Bracelet." 14th March, 1891.

4,614.—T. W Jones, Birmingham, "Sleevo and cuff links." 14th March, 1891.

Gazette.

Bankruptcy Proceedings.

Murgatroyd, Frank, jeweller, 2, Police-street, Brighouse.—*Creditors*:—

		£	s.	d.
Myers, I. and Son	Birmingham	15	12	7
Marks, A. and J.	Manchester	17	5	1
Shoeps Bros.	,,	35	0	0

Statement of Affairs.—Liabilities.

		£	s.	d.
Unsecured creditors		£101	1	3
Assets.				
Stock-in-trade (cost £100)		£70	0	0
Trade utensils, etc.		2	0	0
Furniture		3	0	0
Book debts (good)		0	7	0
Bad	£1 18 6			
		£75	7	0
Less for preferental claims		3	5	0
		£72	2	0
Deficiency		£28	19	3
		£101	1	3

Cohen, Robert, late 2, Crimble-street, now in lodgings at 14, Lowerhead-row, Leeds, jeweller's assistant. Receiving Order and Adjudication, March 6th.

Murgatroyd, Frank, 2, Police-street, Brighouse, jeweller. Adjudication, March 5th.

Winding-up Notice.

Self-winding Clock Syndicate (Foreign Patents), Limited.—Resolution passed February 13th, confirmed March 2nd:—That the company be wound up voluntarily; and that J. B. Palmer, 110, Cannon-street, and C. B. Crisp, 113, Cannon-street, E.C., be liquidators.

Deeds of Arrangement.

Cook, John Thomas, 15, Waterworks-street, Hull, watchmaker and jeweller. Trustee: George G. Poppleton, C.A., 26, Corporation-street, Birmingham. Filed February 27; unsecured liabilities, £554 14s. 1d.; assets, £475.—*Creditors*:—

		£	s.	d.
Mayer and Fulda	London	19	2	0
Grimshaw and Baxter	,,	25	16	2
Myers, W. and G.	Birmingham	377	2	0
Baylis, H.	,,	15	0	0
Cook, W.	,,	12	1	3
Easten, J., and Sons	Hull	27	1	8
Cook, E.	,,	10	12	6
Briggs, William, and Co.	Sheffield	20	13	4

Davis, L., and Co. (Louis Davis and Henry Joshua Joseph, trading as), Montreal, dealers in jewellery. Trustee: Allen Edwards, C.A., Bennett's-hill, Birmingham, Composition to English creditors of 10s. in the £, by three equal instalments, at 6, 9, and 12 months, from March 1, 1891, last instalment to be secured. Filed February 27; unsecured liabilities, £10,991 16s. 9d.—*Creditors*:—

		£	s.	d.
Baches and Strauss	London	1,599	7	9
Lindenbaum and Weil	,,	628	15	0
Ehrmann, B.	,,	444	17	9
Sage, F., and Co.	,,	227	1	0
Mayer, Max	,,	531	4	6
Heymann, W.	,,	1,371	0	0
Denwoody and Willmot	Birmingham	53	1	6
Davis, Montagu	,,	113	8	6
Usher, S.	,,	128	14	0
Hyde, H., and Son	,,	173	12	0
Spiers, R., and Co.	,,	435	14	7
Jacob, M. L., and Co.	,,	20	12	0
Cohen, A., and Son	,,	359	9	6
Booth, E. F., and Son	,,	62	2	0
Payton, C., and Son	,,	206	5	10
Levi and Salaman	,,	120	19	7

		£	s.	d.
Banks, J. M	Birmingham	145	3	0
Fridlander, A. A.	,,	42	0	0
Woolley, Thomas	,,	301	12	10
Spiers, J., and Son	,,	27	16	6
Pembroke and Dingley...	,,	158	5	5
Antrobus, A.	,,	114	16	0
Johnstone, J. T....	,,	81	11	0
Neal, W.	,,	55	8	10
Johnstone, G. H. and Co.	,,	1,027	0	7
Fenton, James	,,	105	4	4
Spiers, D. and L.	,,	693	8	4
Smith, A. J.	,,	54	0	0
Sheldon Bros.	,,	19	8	0
Gibbons, A. E. and Co.	,,	58	6	6
Reading, A. C. and Co.	,,	117	6	0
Sanders Bros.	,,	42	2	5
Bragg, C. B. and Co.	,,	26	5	6
Rabone, W. H. and F.	,,	52	10	0
Hollis and Newman	,,	226	12	1
Stokes, G. H.	,,	47	17	0
Levetus Bros.	,,	116	13	6
Levetus, E. M.	,,	28	4	0
Hinde Bros.	,,	309	8	7
Wrighton, C. W.	,,	302	10	6
Lee and Wigfull...	Sheffield	97	16	1
Allen and Darwin	,,	144	5	0
Levesley Bros.	,,	69	5	0
Fenton Bros.	,,	12	19	3
Dixon, James, and Son	,,	23	15	0

Fletcher, William James, 11, Royal-avenue, Belfast, jeweller (Petition for arrangement). Filed February 27; unsecured liabilities, £2,398 9s. 3d.; assets, £4,246 3s. 1d.—*Creditors*:—

		£	s.	d.
Baume and Co.	London	102	11	6
Buller, Hutchinson and Co.	,,	59	14	3
Green and Carpenter	,,	39	12	0
Mayer and Fulda	,,	39	9	0
Wakely and Wheeler	,,	35	15	9
Dimier Bros., and Co.	,,	31	0	0
Staufter, Son, and Co.	,,	30	6	0
Johnson and Co.	,,	25	14	4
Wiell and Co.	,,	10	9	6
Walter, W. H.	,,	10	0	5
Miller Bros.	,,	9	13	4
Saunders and Shepherd	,,	8	9	3
Lamoille, E. Gay, and Co.	,,	8	9	0
Société de Lunettes	,,	7	15	8
Sage, Frederick and Co.	,,	14	5	6
Achille, Brocot	,,	6	7	6
Harper, A , and Co	Belfast	25	9	6
"Northern Whig," Limited	,,	22	18	0
Robb, John, and Co.	,,	30	0	0
Belfast Corporation	,,	16	3	10
"Belfast Newsletter"	,,	5	0	0
Lyons, James	,,	13	3	0
Cohen, J., and Son	Birmingham	397	1	8
Joseph, B. H., and Co....	,,	367	0	1
Fitter, H , and Sons	,,	203	4	2
Neville, Richard...	,,	69	4	6
Sherwood, John, and Sons	,,	34	11	3
Blanckensee, S., and Son, Limited ...	,,	32	3	9
Wolffe Bros.	,,	29	13	0
Latham and Morton	,,	14	9	0
Turnbull Bros.	,,	11	2	6
Nathan and Hayes	,,	9	7	0
Daniel and Arter	,,	9	15	10
Horton and Allday	,,	5	15	9
Masters, Joseph, and Sons	Coventry	77	12	8
White, Joseph, and Son...	,,	74	15	0
Hill, Charles J.	,,	64	12	6
McCrossan, Joseph, and Sons	Glasgow	23	14	2
Davis, D., and Sons	,,	10	11	10
Baird, John	,,	10	1	2
Atkin Bros.	Sheffield	136	15	1
Round, John, and Son, Limited ...	,,	78	11	8
Travis, George, and Co.	,,	43	16	5
Rodgers, Joseph, and Sons, Limited ...	,,	33	5	5
Roberts and Belk	,,	24	13	6
Hutton, William, and Sons	,,	15	4	4
Fenton Bros.	,,	10	10	0
Humphrey, W. R., and Co.	,,	9	8	5
Boardman, Glossop, and Co.	Sheffield	9	6	0
Dixon, James, and Sons	,,	6	13	5

Total Estimated Debts—£2,398 9s. 3d.

Grimmett and Simpson, Camden-drive, Legge-lane, Birmingham, cabinet brassfounders and jewellers' material manufacturers. Partners: Charles Frederick Grimmett and John Frederick Keirle Simpson. Inspector: Philip Bates, C.A., 35, Temple-row, Birmingham. Deed of inspectorship and letter of license, with a view to the gradual liquidation of the joint and separate estates for the benefit of creditors, Filed March 2. Unsecured liabilities, £1,193 19s. 10d. Partners' separate estates: Charles F. Grimmett, 284, Burbury-street, Lozells, Birmingham. Unsecured liabilities, £40 7s. 8d. J. F. K. Simpson, Southwood, Coppice-road, Moseley. Secured creditors, £2,111 10s.; unsecured liabilities, £374 9s. 2d.—*Creditors*:—

		£	s.	d.
Balden and Son	Birmingham	65	0	0
Corporation of Birmingham Gas Department	,, (est.)	15	18	11
Deeley, W., and Co.	,,	16	19	2
Headley and Meaking	,,	11	15	1
Lambley and Sons	,,	12	11	0
Mint, Ltd...	,,	15	13	1
Newton and Co.	,,	11	13	7
Ratcliff, J. F.	,,	426	0	2
Simpson, G.	Northampton	205	0	0
Rates, etc.		29	15	5
Bankers' Claims...		274	3	3
Separate Estate of J. F. K. Simpson.				
Wood, H.	Birmingham	14	0	0
Simpson, George	Northampton	320	0	0
Separate Estate of C. F. Grimmett.				
Bleiben...	Birmingham	11	0	0

Jefferson Bros., 68, Low-street, Keighley, watchmakers and jewellers. Partners: John Edwin Jefferson and William Jefferson. Trustee: John R. Whiteley, C.A., Keighley. Filed March 6; secured creditors, £117 7s. 6d.; unsecured liabilities, £1,016 0s. 8d.; assets, £800.

McKeand, Ellen, 25 and 26, Market-house, and 3, Sarah Ellen-street, Blackburn, jeweller and fancy dealer. Trustee: Peter F. Turner, P.A., Blackburn. Filed March 9; unsecured liabilities, £564 2s.; assets, £40.

Roger, David, 4, Golden-square, S.W., and 16, Granard-road, Wandsworth - common, S.W., manufacturing jeweller. Trustee: Daniel Welby, Garrick-street, W. Composition of 5s. in the £, payable by two equal instalments at 3 and 6 months from April 1, 1891, secured by assingment to Trustee. Filed, March 11, 1891; unsecured liabilities, £1,168 10s.; estimated net assets, £175.—*Creditors*:—

		£	s.	d.
Welby, D. J.	London	308	9	6
Witehorn, E.	,,	163	16	3
Lord and Dimeaux	,,	92	7	2
Harrison Bros. and Co....	,,	36	18	2
Crook, Edwin	,,	24	1	2
Bracebridge	,,	21	17	6
Ayres, T. R.	,,	19	5	0
Hugueonion, Hall and Co.	,,	14	15	6
Norman	,,	13	17	6
Betteridge	,,	12	12	0
Kilpatrick	,,	14	4	0
Ayres	,,	100	0	0

Bills of Sale.

Ennis, Joseph, 45, Lillyville-road, Munster-park, Fulham, dealer in jewellery and turf commission agent. In favour of Arthur R. Martin. Filed March 13. £40.

Cole, Thomas, 9, Regina-road, Tollington-park, silversmith, jeweller, and general mounter. In favour of Wm. J. Hollingsworth and another. Filed March 13. £30.

Schut, Jean Francois (otherwise Johan Francois Schut), 30, Burton-crescent, Euston-road, goldsmith and jeweller. In favour of London and Westminster Loan Company. Filed February 17. £230.

Sheppard, William John Jesse, 320a, Essex-road, Islington, jeweller. In favour of John B. Sheppard. Filed March 9. £80.

Green, Richard Angell, Cholmondeley-cottage, Friar's-lane, Richmond, jeweller. In favour of Emma Jane Green. Filed March 9. £80 absolute sale.

Heward, John Woodfall, 10, Harold-terrace, Hermitage-road, Green-lanes, and 46, Spencer-street, Clerkenwell, maker of chronometer escapement and keyless motions to watches. In favour of J. Robey and another. Filed March 9. £50 of property at Clerkenwell, aforesaid.

Dissolutions of Partnership.

Marshall and Sons, 87, George-street, Edinburgh, goldsmiths and jewellers. February 14th. Debts by William Brook, who continues under the same style until Whitsunday next, thereafter at the same place, in partnership with his son, Alexander J. S. Brook, under the style of Brook and Son. Thomas Smith will carry on business with his two sons, at 28, Princes-street, under the style of Thomas Smith and Sons.

Walter and Abrahams, 23, Holborn-viaduct, diamond and general merchants. February 12th.

Fanell, R., Elliott and Co., Bedford Plate-works, Bucknall-street, Oxford-street, London, and 13, Norfolk-lane, Sheffield, silver and electro-plate manufacturers. December 31, 1890. Debts by Rupert Favell, who continues under the style of R. Favell and Co.

Millidge and Sons, 28, Princes-street, Edinburgh, goldsmiths. By retiral of Edwin Milledge, sole partner, who has disposed of the business to Thomas Smith and Sons, Edinburgh, goldsmiths, who continue in their own name.

Venour, F., and Son, 97, Spencer-street, Birmingham, manufacturing jewellers and silversmiths. January 1. Debts by George Frederick Venour.

Notices to Creditors.

Giannazzi, Augustus, 1 and 1a Conduit-street, Regent-street, jeweller and watchmaker, inventor and maker of the magic clock. Trustee: W. T. Gilbert, C.A., 18, Clement's-inn, Strand, W.C.—Released Jan. 30.

Needham, James Goodrick, 103, West-street, Sheffield, watchmaker and jeweller. Discharge granted (Jan. 22) as from Feb. 22.

North, R. E., 57d, Hatton-garden, diamond merchant and polisher. Proofs for intended dividend. Trustee: J. Arman, 1, Walbrook, E.C.

Ingram, David Christopher, Penzance, jeweller and watch maker. Discharge granted (Jan. 15) as from May 15.

Lyus, Samuel, 11, Brunswick-road, Camberwell, jeweller. First and final dividend of 10½d. at Official Receiver's, 33, Carey-street, W.C., any day (except Saturday) between 11 and 2.

Hoddell, Cope, trading as James Hoddell and Co., 4, Oxford-terrace, St. Mary-church, Torquay; and Chapel-fields, Coventry, watch manufacturer. Discharge granted (Jan. 20) as from April 20.

Brenholz, Harris Davis, 29, Summerhill-terrace, Birmingham, jewellers' factor. Proofs for intended dividend. Trustee: A. Edwards, 14, Bennett's-hill, Birmingham.

Wetton, William, Bradford-road, Brighouse, jeweller. First and final dividend of 2½d. at Official Receiver's, Halifax.

Estate Sequestered.

Ferguson, John, 41, Castle-street, Inverness, watchmaker. Feb. 19. Election of trustee and commissioners. Procurator's rooms, Castle, Inverness. Claims by June 19. Agent: Pat. D. Mactavish, 4, Lombard-street, Inverness, solicitor.

Applications for Discharge.

William Geddes, formerly of Great Marlborough-street, diamond merchant, applied for his discharge in the London Bankruptcy Court. The debtor filed his petition in September, 1888, with liabilities amounting to £5,052 and assets estimated to realise £40. Various charges were made against the bankrupt, and Mr. Registrar Brougham, in giving judgment, held that the bankrupt had been guilty of misconduct as a trader, in selling goods under cost price and pledging goods shortly before his failure, that he had traded after knowledge of insolvency, and had contributed to his bankruptcy by rash and hazardous speculation. The discharge must be suspended for five years.

Samuel Hyam Weingold and Maurice Levy, who formerly carried on business as wholesale jewellers at 28, Great Ducie-street, and 1, New Bridge-street, Manchester, applied for their discharge in the Manchester Bankruptcy Court. The Official Receiver reported that the debtors were adjudicated bankrupts in July, 1887. Their unsecured debts amounted to £2,791 3s. 9d., and their assets realised £861 4s. 10d. A dividend of 4s. 10d. in the pound had been paid. The bankrupt Levy had omitted to keep proper books of account, and had contracted the whole of the debts provable in his bankruptcy without, at the time of contracting them, any reasonable expectation of being able to pay them. The true cause of the insolvency was the sale of goods at an unremunerative price, the result being, as Mr. Weingold admitted, without contradiction by Mr. Levy, that the two had been from 1883 living on their creditors to the extent of £1,063. Traders complained with justice that such men as the bankrupts ruined the trade in which they were engaged by preventing their co-traders from obtaining fair and legitimate profits. The Judge did not consider the case a very bad one, but offences had been committed which the Court must treat as serious offences. It would be a misfortune if the public were led to believe that the Court would treat such offences lightly. Reckless trading undoubtedly caused the bankruptcy. The discharge was granted subject to a suspension of 18 months.

ANSWERS TO CORRESPONDENTS.

We have to sincerely thank subscribers for the many letters received during the past month congratulating us upon the improvements and merits of the Watchmaker, Jeweller and Silversmith. It is very cheering to see our efforts appreciated, and we can only say in reply to them all, that we shall endeavour in future to make all feel as J. J. felt when he forwarded his subscription, "It is the best five shillings I ever spent in my life."

Local Societies.—We should be glad if all Secretaries of Local Societies would kindly favour us with their addresses, as we are continually applied to for them.

Messrs. Pilkington and Others.—The address of Mr. Newcombe is 2, St. Anne-street, Liverpool.

Messrs. B., Durham, write: "We think, Mr. Editor, a hint might be given to the window ticket manufacturers: a watch ticket and hook combined could be made of a suitable metal, and enamelled to look very beautiful. If some English manufacturer would introduce metal show tickets in place of card, he might possibly save foreigners the trouble." Something of this sort has been attempted, but not in the elaborate manner it might be.—Ed.

H. P. writes: "I am very pleased with the general get-up of the paper, and with all it treats of. If I might suggest that if you could induce some of your watch making clients to advertise a cheap keyless non-magnetic watch, I am sure it would sell well. I see a Birmingham manufacturer does advertise one, but it is not keyless. I would not trouble you, but I am sure that a large sale would ensue. I feel sure our Swiss friends could put a silver keyless non-magnetic on the market at 25s., if they liked."

A. Widman.—The stone sent for examination is a topaz recently cut. The pattern is one which at one time was not used at all, and only recently for topazes, but which, nevertheless, suits it very well. It is rather nice in colour, and an exceedingly lovely stone. The topazes have a very long hue-suite from whites through violets, blues, light greens, yellows of all shades and tints to almondine-red, or even darker than that. One of the easiest ways to tell a topaz is to tickle it (if we may use the expression) with a camel hair brush, when it becomes electrified and will pick up a piece of tissue paper ⅛ of an inch square or more. We are always pleased to give any information we can upon matters relating to trade, either directly or indirectly.

Gravity.—It is well known that the specific gravity or density of some alloys is greater than the mean of their constituents, and that in some instances the reverse is the case. Some years ago, we made a series of experiments upon the different standards of gold as used in the trade, and found them all rather less, which is no more than one would expect, for in each case we should expect the molecules of a homogeneous material to lie closer than those of one composed of atoms of different elements. But with alloys of gold and zinc, gold and antimony, gold and cobalt, and gold and tin, the reverse is the case, and the density of the alloys is greater than the mean of their constituents, which is rather more difficult to explain.

J. Watson.—To solder the cast-iron figure we can recommend a method which we have seen employed in the factory successfully: Cleanse the article from grease and then scratch-brush it until there is quite a coating of brass upon it from the brush; you can then treat it like ordinary brass; first tin it, and then solder in the usual manner.

Alfred Smith.—Many thanks for congratulations. We should recommend amongst others Messrs. Wilkins and Co., 11, St. John-street-road, Clerkenwell, E.C., for the kind of thing you require.

J. C. Carey.—The fusing point of aluminum is not higher than gold. On the contrary it is only 1292deg. F., whereas gold is 2282deg. F. Aluminum can be hard enamelled. Some of the most beautiful examples are to be had in the Swiss and French opera glass.

Marine Chronometers.—Mr. W. H. Riley would like to know the opinion of members of the trade, as to the best book published on the making and adjustment of marine chronometers, describing the various processes used. He requires such a work as would be of practical assistance to a watchmaker's apprentice who thinks of going in for the chronometer trade.

F. Lomas.—Next month.

To the Editor of The Watchmaker, Jeweller and Silversmith.

THE ENGLISH WATCH TEST QUESTION.

If the conclusion arrived at by the magistrate in this case be the true rendering of certain clauses in the Merchandise Act, in relation to the production of English watches, then the London manufacturer's position is materially and injuriously affected in regard to all the complicated "movements," which cannot commercially be produced in this country, with its wonderful and delicate mechanism.

These particular "movements" from "La Valleé" are built up in Clerkenwell, by means of all its various branches, into English-made watches and sold as such; but, according to the argument of the learned counsel on behalf of the "Association," this high and costly class of watch must be branded "Swiss Movement," or "Foreign Origin," for the purposes of this Act, and then he clenches with delight his strong point, viz., that the value of this costly London-manufactured watch will be diminished in the eyes of the trade.

What shall we think of the eminent horologists, as "Vulliamy," "Vyner," "Arnold," "Frodsham," "McCabe," and others, who reared high the standard of excellence in English watchwork upon this system of manufacture. Their fair fame and illustrious careers condemn the debasing action and wicked proceedings of these isolated units, of a falsely called "Protection Society," to paralyse the skilled labour employed in the best class of the watch industry in London.

Combination, not isolation, is needed to resuscitate the trade.

Carley and Co.

To the Editor of The Watchmaker, Jeweller and Silversmith.

The more we study the important decision recently given in relation to the adoption of a rough movement, partially made abroad and manufactured by means of all the branches existing in London into an English built watch, the more we are convinced that the *spirit* of the Merchandise Marks Act was never intended to operate to the disadvantage of and against the interests of the highest and most costly class of complicated watch manufacture.

At the largest and most representative meeting of the watch trade section ever assembled and summoned by the Chamber of Commerce, this very vital question was under consideration, and future action will be taken to remedy the present unsatisfactory state of things as to the working of the Act.

It is idle for anyone to attempt to throw dust in the eyes of the trade as to the manufacture of these complicated "movements." With all the complete mechanism attached in this country, it cannot be accomplished in the "hole-and-corner" system suggested by one or two members at the meeting, who are not practically acquainted with this special kind of work.

It can only be successfully carried out by having all the elaborate means, the trained experience, and the various workmen imported from the seat of manufacture.

Regarding the centre seconds rough movement, which formed the subject of the "test," it was put in hand in perfect good faith as not being in any sense an infringement of the Act (and made prior to the passing of Act), was jewelled by the ex-chairman, and worked upon by members of committee of the Trade Association.

These skilled experts received the highest prices for their labour in the course of our manufacturing this London-made watch, and which is not yet completed.—Faithfully yours,

Carley and Co.

To the Editor of The Watchmaker, Jeweller and Silversmith.

THE PLATE LICENCE.

Sir,—In accordance with a previous promise, and referring to my letter of last month, I have made it my duty to personally interview many of the watchmakers and jewellers in Cumberland, with the result that I find they nearly all complain of the damage done to their business by agents selling watches and jewellery, and most of them say that they would gladly pay a minimun licence of £5 5s. or £5 15s., if only agents could be compelled to pay the license or give up selling watches, etc. The Inland Revenue authorities are too lax in the matter. Some jeweller in each town ought to take the work in hand, and as far as possible do what I have done. Don't wait for someone else to do it, but begin yourself at once. What is everybody's business, generally ends as nobody's. Get the opinions of all the jewellers in the district, then bring the matter under the notice of the Inland Revenue officers, and if possible get the local member of Parliament to take the matter in hand. All ironmongers, drapers, fancy goods dealers, perfumers, etc., who sell articles containing any portion of gold or silver ought to be compelled to pay the full licence. This mischief seems to be very great in Carlisle.

The following jewellers are all in favour of retaining the plate licence; many of them are quite willing to have it doubled (upon condition that the Inland Revenue officers do their duty), and all are opposed to the abolition of Hall-marking:—*In Carlisle*: Stephenson, John Wilson. D. Wigston, G. Potter, G. Routledge, J. W. Johnstone, J. P. Dowell (Mr. J. A. Wheatley I was unable to see); *Keswick*: John Birkett, W. Furness and W. Atkinson; *Whitehaven*: Sutton, J. Spittall, W. H. Telford, S. Hinde, and A. Lockhart; *Workington*, H. Hall, J. Mandale, Thos Scott, T. Williams and J. Hardon.

In Penrith all the jewellers are agreed as to the advantage of paying a higher licence, and putting a stop to the sale of watches, etc., by agents. The names given above are in no stated order, but just haphazard as put down. I shall be glad if anyone will suggest what our future course in this matter ought to be.—Yours faithfully,

J. Simpson Yeates,
Watchmaker and jeweller.

7, Devonshire-street, Penrith,
March 17th, 1891.

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Watchmaker, Jeweller
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The Merchandise Marks Act.

It will be remembered that at the influential and representative meeting of the Trade, convened under the auspices of the Watch Trade Section of the London Chamber of Commerce, as reported in our last issue, a Committee was appointed to go further into the intricacies of the Merchandise Marks Act, and to co-operate with the watch trade section in giving effect to the resolutions. This Committee, representing the interests of London, Coventry and Prescot, have since met, and after well threshing out the numerous points entailed, and the various bearings of the Act, they recommend the trade to seek no legislative alteration in the wording of the Act. It was further resolved that in the opinion of the meeting the Act as it stood required that whenever an English watch had any "material" part made abroad, it was necessary that this fact should be engraved upon the top plate of the watch, as "Repeating-work, Swiss;" "Chronograph-work, Swiss"; or "Calendar-work, Swiss." This of course does not represent the course of action which the whole Trade have agreed to adopt; the recommendation is only that of the Committee, and will have to be submitted to a general meeting. But having been fully aware of the evils which the Merchandise Marks Acts sought to suppress, and having studied the Act since before it became law, we anticipated this result. After all is it not the most honourable and law-abiding course to adopt? It is the decision of a thoroughly representative and qualified body of the Trade as it was possible to get, and we quite fail to see anything in it against which a thoroughly honourable manufacturer or dealer can object. But whether one feels inclined to accept these recommendations or not, of this we may be sure, that in the light of the recent substantiation of the Act, opinions will avail nothing. The Act is not only law, but will assuredly be enforced. The question of correctly marking foreign-made goods is employing the minds of statesmen in several countries at the present moment; and recently there has been no less than three measures on this subject presented to Parliament, *viz.*, one by Baron de Worms entitled "The Merchandise Marks Act Amendment Bill," and two introduced by Mr. Howard Vincent entitled "False Marking Prevention." The former passed its third reading on April 7th, and although only a short Bill, it is a most powerful weapon to the Merchandise Marks Act, making a "Customs entry" a "trade description." It thus makes a "Customs entry" not only a very elaborate and detailed document, but also renders it absolutely necessary that it should be perfectly within the requirements of the Act. And further it provides for prosecutions being undertaken by the Board of Trade, but does not deprive anyone else prosecuting if they wish. As the Act is only a short one we have printed it *in extenso.*

A Bill to amend the Merchandise Marks Act, 1887.

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons, in this present Parliament assembled, and by the authority of the same as follows:

1. The customs entry relating to imported goods shall, for the purposes of the Merchandise Marks Act, 1887, be deemed to be a trade description applied to the goods.

2.—(1.) The Board of Trade may, with the concurrence of the Lord Chancellor, make regulations providing that in cases appearing to the Board to affect the general interests of the country, or of a section of the community, or of a trade, the prosecution of offences under the Merchandise Marks Act, 1887, shall be undertaken by the Board of Trade, and prescribing the conditions on which such prosecutions are to be so undertaken. *The expenses of prosecutions so undertaken shall be paid out of moneys provided by Parliament.*

(2.) All regulations made under this section shall be laid before Parliament within three weeks after they are made if Parliament is then sitting, and if Parliament is not then sitting, within three weeks after the beginning of the next session of Parliament, and shall be judicially noticed, and shall have effect as if enacted by this Act, and shall be published under the authority of Her Majesty's Stationery Office.

(3.) Nothing in this Act shall affect the power of any person or authority to undertake prosecutions otherwise than under the said regulations.

3. This Act may be cited as the Merchandise Marks Act, 1891, and the Merchandise Marks Act, 1887, and this Act may be cited together as the Merchandise Marks Acts, 1887 and 1891.

One Bill of Mr. Howard Vincent, entitled "A Bill to Check the False Marking of Worthless Goods by the use of Blind or Fictitious Names," was brought forward on the 17th ult., and rejected by a majority of 89 to 16 votes. As this Bill was merely a repeal of sub-section three of section three of the Merchandise Marks Act of 1887, the latter still remains unaltered, except by the extension of its operations and powers as conferred upon it by the Bill of Baron de Worms. The other Bill of Mr. Howard Vincent is "For the Further Prevention of Fraud by False-Marking," which prohibits any kind of merchandise being imported into the country without being marked in a legible and conspicuous form, a definite indication of the country in which such goods were made or produced, and further that after the passing of the Act no goods of any description shall be offered for sale without bearing such marks. The latter Bill has not yet become law, and may probably meet the fate of its predecessor. Should it, however, become law it will give rise to a considerable amount of trouble and annoyance at first, as it necessitates the marking or re-marking of every description of merchandise which do not fall within the provisions of the Merchandise Marks Act. This Bill is only another illustration of how necessary it is for business men to watch the origin and making of the statutes of the country and to oppose them before they become law.

Laws and Liberty.

THE further we go back into the history and necessity of law making, the more simple and possible do we find it to have been. But with the growth and complications of modern life individual interests become so multifarious and interwoven, that to make a law against any standing evil is bound not only to tread upon the liberties and privileges of others, but to cause the innocent to fall a victim to its operation. For many years different trades and professions have found it absolutely indispensable to band together and take united action to watch each Act as it is presented for the consideration of Parliament, and, if required, to take necessary steps to oppose its enrolment in the statutes of the land. There are many trades to-day steadily pursuing an honourable calling in a practically undisturbed manner, whose existence would simply have been intolerable had it not been for the manly and heroic opposition with which Trade Associations fought for their rights, and of which they would have been robbed by laws introduced by well intended persons who had other objects in view. Trade after trade, and profession after profession have realised this, but we have not. The Merchandise Marks Act was not only allowed to pass, but to remain in existence for over three years, before many members of the trade had even read it, and then only through having it forced upon them by a prosecution. We hope that this will convince the trade of the necessity of an Association to watch its interests in no half-hearted manner. As an instance of how necessary it is to watch law-making assemblies, we might quote the case of the "Listing Bills" presented in the New York Legislature, by which a full annual exposure of the entire property and business relations of every adult inhabitant of the State is compelled, under unusually harsh penalties, for purposes of improving the present system of taxation. But only imagine for one moment all one's books, detailing the name and address of customers, thrown open to practically public gaze, and we can realise in some manner how disastrous may be the subjective effects of an Act with quite another object in view.

The Markets.

DIAMONDS.

NOTWITHSTANDING the alarming reports that some journals have attempted to put upon paper to persuade people into believing that a great fall in the price of diamonds was imminent, consequent upon the discovery of a new diamond mine, which was going to cause the De Beers to lose their monopoly, and so bring down the price of the noble gem, nothing of the sort has occurred; and so far as we understand things is not likely to happen, so long as the world goes on in the prosperous way it is going. It is true that the outlook in the Cape is very cheering so far as discoveries are concerned, but whether they are likely to affect the market much for any length of time is quite an open question. Past experience has shown that mines cannot be worked very long by small claim holders. And despite all rumours prices remain firm.

PLATINUM.

IT begins to look as if the ultra-aurian price which was predicted for this valuable metal was only a dream, and if its rise was great and quick, so has its fall been, it now being quoted at 55s., whereas it has been nearly 50 per cent. higher than this.

SILVER.

THERE has been an absence of that up-and-down motion in the price of the stable metal during April, rises and falls being usually quoted by farthings or even sixteenths, keeping pretty close to 44d. during the whole time.

MOTHER OF PEARL.

AT the public sale held in London, there was a good attendance of buyers, and competition was generally keen. Manillas were a little easier, say 5s. per cwt. lower, large and medium shells bringing from £7 15s. to £9. Sydneys, Pile I., brought from last prices to 10s. down; large and medium, selected, brought from £7 10s. to £9; small medium and chicken sold at about 5s. per cwt. advance on last sale. West Australian were firm to 5s. higher; large and medium, selected, sold at £5 17s. 6d. to £7 15s.; small medium and chicken, about 5s. over last rates.

UNFORTUNATELY our issue is overcrowded this month, and we have found it necessary to leave out a number of things which would have been both valuable and interesting to our readers, such, for instance, as the papers which have been read upon Cloisonné enamelling, and the "Letter from the Diamond Fields," which describes a discovery of new diamond mines.

WE regret to inform our readers, who are not already aware of the fact, that Sheffield is now visited by a serious outbreak of the Russian influenza, or as the Americans and French prefer to call it, "la grippe." Many of the factories are seriously crippled, much anxiety and inconvenience being thereby caused. Many of the reports which have reached us are of a very serious and distressing nature. The local papers also speak of the serious death-rate. Amongst those smitten down is our own correspondent, so that we are unable to give any "Sheffield Notes" this month.

AT the Northwich County Court, Mr. Fryer, jeweller, Winsford, was awarded £3, the value of a clock damaged in transit on the London and North-Western Railway.

Notes About Town.

(By our London Correspondent.)*

State of Trade. With the wintry weather that lasted beyond the middle of April, trade was not at all what one expects at this time of the year; as soon, however, as any signs of brighter weather evinced themselves people began to get out more and buy, and trade began to show fresh signs of activity. Some of the novelties which ought to have become popular at Easter-tide were then moved, and orders for them repeated.

* * *

A Valuable Novelty. If there is one case more than another in which we suffer absolute painful fatigue for want of a little ingenuity, it is in the case of opera-glasses. It has long since been realised that it is painful for a lady to hold her eye-glasses up to the eyes for any length of time, and accordingly long handles have been provided to meet the requirements. In the case of the opera-glass, which is many times heavier and often held to the eyes for a considerable time, we have neglected this provision. A thorough good opening, therefore, lies here for all sorts of long handles of gold and silver. A larger field for variety of design assuredly does not exist, and if made in good qualities would make at once a very desirable, useful, and effective present. They could be made with all kinds of springs to grip the glass, and each manufacturer could register or patent his own. We know as a fact that they are very often asked for by customers in good houses; and now that chased silver goods are getting to the end of the tether for uses to which they can be extended, and yet retaining their popularity, never was a more opportune moment to introduce a useful and taking novelty than one of this sort.

* * *

Window Novelty. We often wonder how it is that such delicate novelties, which captivate alike the lovers of fashion and the admirers of the beautiful, are so frequently born in the French capital. May not some of them arise in the fact that the delicate and refined hand and taste of Madam is not above taking a lively interest in businesses of the first standing, when in this country the proprietor's wife would feel an indignity at speaking to one of the principal assistants or even entering the establishment? Lately, in a good house in Paris, the hands of Madam might have been recognised in a centre-piece consisting of an exquisitely twisted turban of the lightest green tulle, midst the delicate folds of which were laid diamond sprays with remarkable effect. The design was soon copied, but we think it has not yet reached London.

* * *

Pending Exhibitions. The Naval Exhibition opens on the 2nd May, and will doubtless attract considerable attention—quite as much, or even more, than did the Military Exhibition. The exhibits will include some treasures of horological skill, including Harrison's chronometer, and other historic monuments. Optical and nautical instruments of all kinds will put in a good display, and exhibitors may possibly reap a good harvest, and those interested in them find food for instruction. The Spectacle Exhibition, too, must not be lost sight of, for although called a "Spectacle" Exhibition, from being under the auspices of the Spectaclemaker's Company, the exhibits will include all optical instruments we believe, or, at any rate, all those of everyday use. We think the exhibition will afford a good opportunity for any ingenious and clever optician to bring himself before the City Companies, and if it be an honour to which he aspires, no doubt amongst the prizes offered will be included the Freedom of the Company.

* * *

Persian Honours. It is said that when the Shah of Persia was here the last time he "took great interest in the mechanism of high-class watches, and suggested several ingenious improvements," some of which were carried out for him by Messrs. Kendal and Dent, with the result that the latter have lately been honoured with the dignity of "Watchmakers to the Court of Persia." We suppose the Shah must have felt a great difference in the manner in which he was received by English jewellers the last time compared with the first. We know that on the first occasion he "took great interest" in jewellery, and had some very elaborate pieces made to his own instructions for the hostesses who so magnificently received the semi-barbarian; but unfortunately he forgot to pay the last and most important visit to the establishments he had otherwise honoured. It thus became evident that the patronage of the King of Kings was not a consummation greatly to be wished for.

Round the Paris Manufactories.

[From Our Special Correspondent.]

There are two points of surperlative importance alike to the manufacturer and the trader. They are, firstly, what is new; and secondly, what is of far greater moment, what is selling. It is easy enough for a designer to sit down and make designs *ad infinitum*; but whether any of these designs will ever prove worth the paper upon which they are drawn is another matter altogether. In looking through the portfolios and design books of the Parisian manufactures, the first thing that strikes one is the adhesion, as a rule, to art principles—the outcome of technical education. It is often carried to an extent that makes the design impracticable or defective as an article of use. There are usually such deep draughts from the classic, which at once separate them from the otherwise beautiful and utilitarian English designs. There is so much less repetition of conventionalised forms, and nature is far more appealed to for inspiration; hence the variety and beauty of many of their designs. Of course it is only just to observe that many of their designs are reformed, and sometimes we venture to say debased, English ones,

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

Old familiar faces are still kept before us in new and more pleasing combinations of swallows and crescents; the swallows are infinitely reduced in size, and sit perched upon the crescent, or have built a nest in its upper part, to which one or more are represented flying. Paraquets, too, either with all diamonds, or more usually with the introduction of coloured stones, in all kinds of taking poses, are in great demand, and lend themselves to an infinity of diversion.

* * *

Few circumstances have given a wider field for things new, curious, and at times beautiful, than the introduction of the Cleopatra jewels. Every kind of jewel is now made of some Egyptian emblem, and from some of the charming manners in which these emblems have of late been employed, we have got quite to admire what we at one time thought stiff and uncanny. A very handsome pin is formed by the lotus opening to various degrees, sometimes in all diamonds, sometimes in coloured stones. In nothing, however, is there the gorgeous effects of some of the enamels composed of crossed batons, ending in the expanding lotus, in the centre of which are groups of Egyptian emblems with asps as supporters, and pendant from which hang carved scarabæ.

* * *

In Brooches, a small diamond ruby-eyed chick—a mere fledgling—is scrambling with expanded wings and open mouth over an egg, placed obliquely on a knife-edge bar; the position of the egg and the expression of "I shall fall" on the face of the chick makes it a very attractive and taking little thing. Herons are now formidable rivals with the so many years favoured swallows; their length of limb lends itself to many very graceful poses. Two horsenails, one of diamonds and the other of sapphires, have their thinner ends entwined, and their other part bent round so as to simulate a horseshoe. Any coloured stones can be used for this, or coloured ones introduced to represent nails.

* * *

Sprays, irrespective of size, are all made very light, drooping, and extremely graceful, with a much more faithful adhesion to nature than formerly; the flowers most employed are those whose blossoms are many petalled, and whose leaves are more serrated. Nothing could be more lovely than some of the charming introductions of gracefully pretty enamelled flowers from amongst diamond leaves, especially some of the simple wild flowers, which have also introduced in a very effective, although not very natural manner upon their petals, diamonds set in collets. One of most charming sprays is doubtless one of the wild convolvulus. The leaves are sometimes of diamonds, but sometimes also of emeralds or enamels, and the flowers of diamonds with the wedge-shape stripe of pink in rubies. It is astonishing how elegant pale rubies look in this flower; usually the spray is from three to six inches long, but a single flower makes an effective and beautiful brooch. The blue variety of the same flower is also represented by the introduction of sapphires. There is also a purple tint. Three gold bamboo rods, about two inches long, are tied together with diamond bands, and across the centre turns a spray of diamond forget-me-nots.

It would be quite justifiable to assert that in the whole history of the jeweller's art nothing has ever been introduced which has admitted such gorgeous effects as the introduction of natural colour enamels of orchids; here a thousand fantastic features burst upon us, in colours only seen by the cultivators of the inestimable gems of the vegetable kingdom; now in single ones, either large or small, and now in flowing sprays; now the nearly white, and now the every coloured; now the simple six-petalled, of practically, only two hues, and now the multipetalled, or curiously anti-flower-shaped form of every hue that is known. Another similar spray is formed of bees in all attitudes composed of diamonds with sapphire eyes, and bodies crossed with rows of rubies. After all, perhaps the grandest spray that has recently been produced is one large natural size poppy with a few buds, with here and there an ear of speared corn, and here and there a corn leaf.

* * *

The innovations recently made in the usual style of earrings are very much on the increase. A diamond horsenail bent round, and apparently passing through the ear, takes very well; of course the nail is made of two pieces, and fits into each other the same as the jointed hair-pins, so that the part that passed through the ear is only of the usual thickness of ear-wires. A basket of flowers, of either all diamonds, or the basket of diamonds and the flowers of coloured stones, is very pretty; the handle passes up to the ear as though it passed through; in reality it is an ordinary lock wire. A style that has taken very well with those who already possessed the stones or who could indulge in the luxury is a diamond solitaire, the wire of which passes through the ear, and turns under the lobe and receives a large drop pearl, giving it the appearance of having no connection with the diamond above, but of dropping out of the lobe itself. Another is a diamond scroll coming from round the back edge of the ear, five-eighths to three-quarters of an inch up, sloping in a beautiful and graceful biennial curve, one member passing backwards over the aperture of the ear, through which the wire secretly passes. Subtended across the curves are five wires, at the junction of which coloured stones are set. In others there are a number—five or seven—collet-set diamonds fitting closely along the bottom edge of the lobe, with smaller diamonds festooned or pendant from them. In another a string of diamond collets passes apparently through the ear, much after the style of the old hoop earrings. A most realistic effect is obtained by a strap of diamonds and a buckle of coloured stones passing similarly through the ear.

* * *

In Pins, a diamond chick, with ruby eye, shakes its almost featherless wings while it pegs away in front upon a silk hat, the rim of which it is trying to get into its mouth. Another somewhat burlesque and amusing pin is a similar fledgling in an erect position, with the air of a strut about the lower part; his wings opened arm fashion, upon one of which rests a banjo, and with the tip of the other he touches the strings, while with fully expanded beak he is serenading to the utmost of its might.

Horological Notes.

ORIGINAL AND "CLIPPED."

Watchmakers and Jewellers' Association.

THE executive committee meeting of the above Association was held at the Commutation Hotel, Liverpool, on April 8th, Mr. John Bryant presiding. The secretary read letters from Mr. A. J. Carver, Falmouth, Mr. J. Marshall, Sleaford, and Mr. Connor, Dublin, asking for information to open branches of the Association. We might add we should also be glad to receive the rules, objects, etc., of the Association, and should be pleased to lay these before the trade for their consideration. At present we regret to say we know but very little of the Association. From reports of this meeting one would gather that its objects were to try and get united and combined action amongst the working members of the trade on matters relating to Parliamentary and other questions affecting the general interests of the trade. They also appear to go very strongly into charitable and philantrophic work.

* * *

Watch and Clockmakers' Asylum.

THE 38th annual meeting of the donors and subscribers to the Watch and Clockmakers' Asylum, New Southgate, was held on Monday, at the offices, 35, Northampton-square, Clerkenwell, Mr. T. Baxter, chairman of the committee, presiding. The report presented was very satisfactory. The balance-sheet, in which the amount raised at the dinner was not included, showed a deficiency on the year's working of £28 12s. 3d. The chairman briefly moved the adoption of the report and accounts, stating that although not yet able to announce the result of the festival dinner, he could tell them everything was most satisfactory. He pointed out there had been exceptional expenses during the year, expenses forced upon them by the Barnet Local Board in connection with the drainage, and this large outlay more than accounted for the deficiency. The report and accounts were unanimously adopted. The remaining business comprised the election of Mr. P. Woodman as treasurer; the re-election of Messrs. Vine, Cole, Halford and Thwaites as members of the committee, with the addition of Messrs. J. Woodman and Dunn to fill vacancies; Messrs. Bickley, Usher, and Stockall were re-elected as auditors, their number being augmented by the addition of Messrs. Cook and Walton; and the election of two pensioners. We regret we were unable to report another important meeting of the above institute, which will be given in our next issue.

* * *

Swedish Watch Manufacture.

AN industry, which seems capable of extension and likely to prove remunerative, is the manufacture of watches at Halda. A few years ago only hand power was used, but the installation of steam power when completed will work about 150 different machine tools. In the main hall are sixty machine tools, many of these having been invented and constructed at the works.

* * *

Barnum's Connection with the Clock Industry.

IT may not be generally known that P. T. Barnum, the great showman who died recently, was once brought to the verge of ruin through his connection with the Jerome Clock Company, of New Haven. It was in the year 1856, and in order to have the company move its extensive works and many operatives to Bridgeport, Conn., Barnum lent his name on security for 110,000dols. The company was unsuccessful and Barnum was reduced to a poor man. He declined offers of assistance from his friends, but sold land that he owned in Bridgeport to Elias Howe, Jr., the sewing machine man, for 50,000dols., and this went toward liquidating the indebtedness of the clock company.

* * *

A Novel Railway Clock.

A RAILROAD man of Louisville, Ky., has invented a novel clock to be set up at stations on lines of railroad and to be operated in connection with the block signal system. The dial and figures are sufficiently large to be seen by the engineer of a rapidly moving train. The hands are also constructed with a view to render them easily discernible from a speeding engine. As a train rushes by the station the hands mark the time of its passage and remain there until the next train appears. A red light is shown five minutes, after which a green light appears, and in five minutes more is replaced by a white light. The engineer of the next train by this means not only receives the signal, but in passing the station may learn from the clock exactly how long previously the preceding train passed the station.

* * *

The Watch Industry in Switzerland.

IN spite of the very severe competition of foreign countries, the watchmaking industry in Switzerland continues to make good progress. The following table compiled from the statistics of 1890, just published in the "Feuille Officielle Suisse du Commerce," gives a comparison of the exports of watches and clocks, etc., during the last three years. It will be noticed that the rate of progress has not been so great last year as in the previous year.

	1888.	1889.	1890.	
Gold watches, chronographs, etc.	29·9	35·9	38·3	millions.
Silver watches	33·3	39·5	41·7	,,
Watches made of nickel etc., and pedometers	12·2	13·2	13·8	,,
Watch movements, fittings and cases	6·5	8·5	8·8	,,
Total of Watches	81·9	97·1	102·6	,,
Clocks and timepieces, including the necessary fittings	0·1	0·1	0·1	,,
Musical chimes and musical boxes	3·0	3·1	3·3	,,
Grand total in millions ..	85	100·3	106	,,

* * *

Curious Mechanical Clock.

THERE has lately been on exhibition in Wisconsin a remarkable clock, made by a Mr. Martin, a millwright of Schwarzwald, Baden. It is divided into four parts—geographical, astronomical, musical, and numerical. A little bell strikes every minute. The first quarter hour represents childhood; the second, youth; the third, middle age; and the fourth, old age. As the clock strikes the hours a corresponding number of apostles make their appearance, from one to twelve. Above them stands Jesus blessing them. The twelve signs of the zodiac are represented. At six and twelve o'clock a sexton rings a bell, an old man kneels in prayer, the cock crows and the organ is played. There are four dials on each side of the clock showing the years on one side and the leap years on the other. Scenes in the life of Jesus are represented at noonday. At midnight heathen gods make their appearance. The four seasons are represented by appropriate figures, as are the moon's phases.

AT Woolwich, James Lawrence, jeweller, Eltham, has been remanded on the charge of embezzling about £1,000 belonging to the Grand Chester Lodge of Oddfellows.

Watch and Clock Making.

(*Continued from page* 210.)

Answers and Notes to Questions set at the City and Guilds of London Institute Examinations.

By I. Hermann,

Director of the Polytechnic School of Watch and Clock Making.

(11.)—Advanced Paper, 1880.

QUESTION (1).—Mention cases in which capillarity, elasticity, expansion, friction, and hardness are taken advantage of in horology?

Answer.—The principle of capillarity affords a guide as to the form of oil cups, the ends of pinion arbors, and staffs, jewel holes, and disposition of jewel covers, and of all parts where the retention of a lubricant is a matter of importance. The condition to be satisfied, that oil may be retained at any desired point, is that the tension or attraction between the fluid and the surface of the part in question preponderates over that of any adjacent part in immediate touch with the border of the fluid. The extent of this attraction is proportionate to the area of surface. Hence the adhesion of a limited quantity of oil to any part is obtained by surrounding the initial area to be covered by a fringe of less attraction, that is a fringe of less area.

Elasticity is used as a means of storage of motive force, as in mainsprings and in various springs of small displacements, as in keyless and repeating motions; and as a central force in the balances of portable timekeepers, where its action as a function of balance-displacement affords the means of producing practical isochronism. (Sec. (4) in I.)

Expansion is taken advantage of to maintain the initial distance of the centre of oscillation from the point of suspension in the pendulum. The rod that connects these points is subject to extension and contraction with a rise or fall of the thermometer. This effect is neutralised by setting up a counter expansion, so that their algebraic sum of variations due to the influence of temperature is zero.

In the case of the compensation balance, the greater expansion of brass over that of steel is utilised to diminish the radius of curvature of the lamina during rise, and to increase it during fall of the thermometer; to produce a decrease of the moment of inertia in the first case, and an increase in the second. The object of this compensation is to neutralise the effect of temperature on the balance spring. But here time is the ratio of two quantities, of which one (the elasticity of the balance spring as the denominator) varies by equal increments; and the other (the radius of gyration of the balance as the numerator) also varies by equal increments (very nearly or practically); but the variation of its effect corresponds to the expansion to the second power of the initial radius plus the increment (by the binominal theorem), hence there is a point where time has a minimum value. In one direction of variation its value increases, because the numerator increases faster than the denominator, and in the other direction the denominator decreases faster than the numerator, and this point of least value (which is found by Hartnup's method) is termed the middle temperature error.

Friction is an indispensable statical condition. It is also utilised as a "break action" to secure isochronism of the pendulum oscillation in the dead beat escapement, and approximate isochronism in the horizontal escapement. Without friction the construction of mechanism of every description would be at an end, for no screw, pin, or bolt would keep fixed, and no two sections could be held together unless riveted, therefore friction is an indispensable condition of all rigid structures. So long as the surface and the density of the lubricant remain in an initial condition the resistance due to friction remains approximately constant as a factor of pressure. In rotary motion its effect as a resisting medium, under constant pressure, varies as the radius of the surface in contact; hence the radius of the circular faces of dead beat pallets and the radius of the cylinder can be made the measure of the check that frictional resistance has on the accelerative effect of increase of motive force, so that by a definite radius of these surfaces the time of an oscillation becomes independent of the variation of impulse force.

Hardness is utilised to reduce work expended on frictional resistance to a minimum, and to prevent a change in the measure of this resistance by the wear of the surfaces in contact, which—other conditions remaining the same—varies inversely as the hardness and smoothness of surfaces.

Remarks.—There is no police force to sustain the majesty of "Natural Laws," yet trespassers are invariably detected and brought to the bar. Unfortunately, however, like in many other instances of moral and political "law breakings," the consequences have often to be borne by the innocent. In cases to which our subject relates, it seems almost as if there was a kind of "conscientiousness" of this sort of hardship in the very inert machines, for it is not an uncommon thing to see the "oily tears" stream down the brass cheeks of clocks and sometimes of watches. We will now endeavour to offer some suggestions that will tend to relieve the sufferings of these useful agents of "strikes." There is no need to suggest any experiments to show the need of attention to the principle of capillarity. Every workman engaged in the repair of clocks and watches has abundant opportunities for observing the result of the neglect of these laws by the manufacturer, and very often by the "jobber" also. In clocks, we find oil collected like dewdrops at the bottoms of plates, or hastening away from the duties it should perform at the pivots; in watches it plays at "hide-and-seek" under the finger-piece of Geneva stopworks, minute wheels, cocks and namepieces of frame movements, leaving the pivots and bearing to work their own destruction. Now all this and similar phenomena are not the outcome of mere caprice on the part of the lubricant, but of the law or principle that subtends it, and by attending to this, we can make it our obedient servant instead of a "misdemeanour." Practically the whole thing resolves itself into a right disposition of parts and supply of fluid, and in order to get an approximate notion as to the "conditions" and measures that constitute the "right" in the case in question, it will be advisable to observe the behaviour of fluids in parallel cases. The principal details that concern us are the effect of gravity, the tension of surface, and attraction between fluids and solids. By reason of surface tension being uniform, drops assume a spherical form; that is, when the quantity of fluid is not too large, otherwise gravitation depresses the surface and presses out the edges of the drop adjacent to the solid on which it rests. That drops assume a spherical form when every part of the surface is acted on by constant forces can be readily seen by putting oil into a mixture of three parts of alcohol to one of water. With care the oil will collect in perfect spheres to the extent of several inches in diameters. Again, if barometer tubes are dipped in fluid, the fluid will rise within the tubes to heights which vary inversely as the diameters of their bores. And, again, if two pieces of plate-glass are brought in contact at one edge, like the adjacent leaves of a partially opened book, and then partly immersed with the touching edges perpendicular to the surface of the fluid, the latter will rise between the adjacent sides of the glasses to heights which vary very nearly inversely as the horizontal distances of any two points on the glasses.* The fact of the variation in the heights of the fluid is due to the opposing forces of tension between the fluid and weight of mass or its gravitation. The fluid will rise until these forces balance, and then it is in equilibrium. The same is exhibited if a needle be dipped into a fluid and then withdrawn. A small quantity of fluid adheres to it; its rise to a certain height shows that the attractions between it and the needle varies as the surface and preponderates over gravity; that its rise is limited may be explained as being due to the fact that, with the dispersion of the fluid, which is a limited quantity, the surface of the fluid is subjected to an increased tension, and when this is in equilibrium with the attraction between the fluid and the solid it is again at rest. Now my object in mentioning these points is to deduce a rule for the formation of oil reservoirs and ends of arbors, so that we may be able to keep the oil where we want it. In the case of oil cups or chamfers, two conditions are involved, viz., form and quantity of fluid applied. In all cases we have to see that local attraction preponderates over gravity; the latter is sure to overbalance the former, either in clocks or watches, when the oil is applied too liberally, and (the liberality is generally greatest with those who don't have to buy the oil) hence the reason of streams of grease on clock plates, and sometimes over those of watches. The greatest attraction between the lubricant and the initial surface in cases of oil-cups is effected by making their depths in excess of their diameter, and taking care that the oil never approaches the top of the cup, for thus the attraction at the bottom is in excess over the attraction between the surface of the fluid and the upper part of the cup, and preponderates over gravitation when the watch is turned over. The form which finishers give to pinion arbors in English watches, that is a "back slope," which form is adapted to facilitate the facing of the pinion leaves, is excellently suited to keep the oil to the pivot. The surface is greatest adjacent to the shoulder, particularly when the angle between the bevel or "break" of the shoulder and the shoulder itself is very large. Thus the attraction between the oil and the arbor is greatest at a point nearest the pivot. Hence, with an arbor of such form on one side, and oil cup as described on the other, and with attention to the quantity of oil applied, the oil will be retained at the pivot the longest possible. Oil cups are best formed in the mandrel, with a well polished cutter that is the exact counter part of the desired shape of the cup. In Geneva watches, the form of arbors of pinions exhibits total indifference to the principle of fluid attractions, on the part of manufacturers, but the worst defaultations occur in top fusee holes of frame watches and lower centre holes in English watches, both frame and three-quarter plates, and without exception in top centre holes of Swiss watches; also in barrel holes in both English and French. When a fusee hole is close to the cock and has no oil cup, the oil is attracted between the two adjacent surfaces of cock and plate, the conditions are identical with those that produce the rise of fluid in barometer tubes or between glass plates as described, and completely drain the oil from the pivot. This "draining" process is further augmented by the pressure on the pivot. Hence, when the oil is squeezed out and an attraction exists outside, causing it to flow off instead of keeping to the pivot, destruction must follow to pivot and bearing. Every fusee pivot requires a raised hole to diminish the pressure on the unit of area, and to allow a sufficiently deep oil-cup without infringing on the area of this bearing. In centre wheels the case is more difficult. It could, however, often, if not always, be overcome by putting a raised bearing and countersinking the cannon pinion, which can easily be effected by giving 14 leaves to the pinion, 12 to the minute nut, and 32 and 63 teeth to minute and hour wheels. The jobber who has not always the opportunity of remedying the evils that fall on him through the "sins" of the manufacturer can limit the dispersion of oil with regard to bad fusee, centre wheel and barrel bearings, by putting the lubricant to the pivot before it is placed in position, and using a denser oil for pivots which are subject to greater pressure. I think sufficient has now been said to enable a practical inference being drawn as to the relative value of star-shaped and club-teeth wheels, forms of pallets of clocks and various other parts where the retention of oil is of the utmost importance. With regard to the other items of this question, we shall meet with them again under other and more direct forms, when I will treat them especially. Evidently the object of the examiner in presenting them in this form is merely to see if the candidate knows anything of them at all rather than to require an analysis of the principles.

(*To be continued.*)

Midland Jottings.

(BY OUR BIRMINGHAM CORRESPONDENT.)*

I WAS talking to one of the leading manufacturers in the jewellery trade a week ago, and he confirmed the reports of others who had told me that at the present time there was quite a phenomenal slackness in "the quarter." The lull cannot last long, but while it does continue, it is the cause of some amount of anxiety both to masters and men.

I FIND there is a demand still for jewellery of floral designs, but that a tendency is observable which favours fruits instead of flowers. Several manufacturers are preparing to supply pieces in gold and silver enamel; and in stones of various kinds, the designs of which are all founded on single fruits, or combinations of various fruits, in order to meet the want. Such a fashion is likely to result in the production of some very charming and fresh work, and will no doubt give an impetus to sales.

MR. F. ARTHUR WALTON, of 54, Hylton-street, Birmingham, has just introduced to the trade his patent "Simplissimus" action for solitaires and studs, which is already in great demand, for the extreme simplicity and the effectiveness of the invention is such as to command a sale at any time. A distinct want has been felt for a really effective arrangement of this kind, especially for the purposes of studs for solid-fronted shirts. It consists of a hard metal stem on the upper portion with a slot all round, and this is pushed into a hollow tube on the lower portion, at the base of which are two parallel springs of hard white metal, which clip the slot and hold the stem in place, while they are so constructed as to allow of the stem being easily withdrawn by a simple outward pull. It is lower in price than any other two-part stud that has been made. A whole set of studs for shirt-front, collar, and wristbands are made with "stones" so as to retail at a shilling. A pair of sleeve studs, gold plated, will retail at sixpence, and everybody gets a good profit.

ANOTHER novelty from Mr. Walton's works is the "Simplex Adjustable" photograph stand which was introduced last autumn, and which Mr. Walton has patented. As now is the time for the sale of this kind of thing, the demand for it justifies the confidence which its inventor was inclined to place on it. It can be instantly placed and fixed at any desired angle; it is perfectly rigid, and is much less likely to topple over than so many articles for a like purpose; it has no springs to get out of order or break; it folds up quite flat, and therefore takes but very little space in packing, and it will hold firmly various sized photographs. In working it is very simple. The parts consist of an upright which is fixed to the portion which holds the glass and photograph, and which carries a lever and a clip, the latter at the top to hold the upper end of the glass and picture.

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* The curve formed by the surface of the fluid is an equilateral hyperbola. This curve is one of the three produced by sections of a right cone in directions which are not parallel to the base. The investigations of the properties of these curves, *e.g.*, the parabola, eclipse and hyperbola, forms a distinct and very important part of Mathematics. See Conic Sections, by C. Smith, article 154, MacMillan and Co.

* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

MESSRS. I. S. GREENBERG AND CO., of Vyse-street, Birmingham, have just completed their large stock of fancy articles for the coming season, which practically commences as the present issue of this journal makes its appearance. The stock includes many novelties of an ornamental and useful character. In jewellery, a large assortment of French paste or imitation diamond may here be seen, as well as best Bohemian garnet work in large variety. Other kinds of stones in various settings are present in large numbers, including necklets of amber and coral, and brooches, ear-rings and pendants in amethyst and topaz. Other specialities are antique silver plate, including Dutch spoons, and flagons, mugs, etc., of various periods. Also silver-mounted toilet requisites, fancy clocks on a variety of stands or in ornamental cases, and a fine selection of frames of different designs and materials for photographs. All those who do a sea-side trade should be in communication with Messrs. Greenberg, who oblige their customers by forwarding parcels of goods on approval.

MESSRS. JOHN THOMASON AND NEPHEWS, of Spencer-street, Birmingham, the successors of Hilliard and Thomason, established for half a century, who are general silversmiths, make a speciality of all sorts of cased goods including fish carvers, salts, cups, goblets and cigar and cigarette cases. These goods, which bear the trade mark "H. and T.," are very suitable for presents for birthdays, weddings, or other such like occasions.

MESSRS. B. H. JOSEPH AND CO. have added to their already very extensive business at 20, Frederick-street, Birmingham, the connection of Messrs. D. L. Davis and Brothers, manufacturing jewellers, lately carrying on business at premises in Vyse-street.

MESSRS. MALE AND JONES, of Hylton-street, Birmingham, make a speciality of bangles and bracelets, of which there are a great number sold, and for which there is a continually growing demand of late, as well as brooches, ear-rings, and scarf pins. These the firm produce in bright gold and in silver.

MESSRS. G. LOVERIDGE AND CO., of 66, Spencer-street, Birmingham, are employed on general Hall-marked jewellery, including a number of novelties in silver and paste in great variety for the home, colonial and foreign markets.

MESSRS. CHARLES FENTON AND CO. is the style of a new firm who have opened an electro-plating establishment in Vyse-street, Birmingham.

THE English Watch Company, Limited, of Villa-street, Birmingham, are engaged on contracts for railway guards' watches and chrono-micrometers, for which they have obtained a Kew certificate, for the Indian State Railway. The firm will shortly have ready for the markets a calendar watch which they have just patented. Its cost is very little over that of an ordinary watch, for the principle is extremely simple.

THERE have been quite a number of cases of interest to watch manufacturers and jewellers in the Midlands during the past month, the most interesting of which is probably that of Walter Brocklebank, who was charged before the Birmingham stipendiary with obtaining goods under false pretences, with illegal pawning, and with larceny as bailee. The goods pawned included diamond rings and watches, some obtained on approval and some entrusted to him for repairs. Some of the approval lots being pledged the same day. The charge of false pretences was dismissed, and the one of illegal pawning proceeded with. The prisoner's counsel, Mr. R. A. Dale, argued that his client had no intention of stealing the goods, and that it was a practice, although he admitted a reprehensible one, for jewellers who were pushed for money to pawn for a while any goods they might happen to have in their possession. If such a practice as this really does exist, the sooner steps are taken by respectable traders to remedy the matter the better. For such a state of things is a dark stain on the commercial morality of "the quarter." The illegal pawning being admitted, it only remained to fix the sentence, and arrange as to the return of the goods. The Stipendiary said his object was to regain possession of the goods, and eventually the various persons concerned in the matter having conferred together, an arrangement was made to which only one dissentient objected. This gentleman wished to prosecute for stealing as bailee, but was told he would have to undertake the matter as a fresh case. In the end the accused was fined for the first offence 10s., and the value of the jewellery £2 11s. 0d., and in default imprisonment for a month; and in the second case, 20s. and the value £14 15s. 0d., and costs of the proceedings, or two months' imprisonment.

ANOTHER case of the illegal pawning of a watch occurred at Redditch, and was tried at the Worcester Quarter Sessions. A silver watch was given to the prisoner—Alexander Ball—to repair, by the owner, Mr. C. H. Houghton, and was pledged for 8s. 6d. Ball was sentenced to three months' hard labour.

A CASE of rather a pitiful nature came before the magistrates at Coventry on the 9th ult., when Mr. Philip Cohen, watch manufacturer, was compelled to charge one of his employés, Charles Wood, a finisher of watches, with stealing a silver lever watch, which he had pawned for 25s. The poor fellow was in a very dejected state, but as he had been forgiven a similar offence only as lately as last November, Mr. Cohen was unable to overlook the shortcoming. The bench sentenced him to two months imprisonment. He has a wife and children.

RONALD PATERSON, a watchmaker, of Evesham, aged 62, was charged at the Birmingham Assizes with stealing a silver watch belonging to Alfred Andrews, who had taken it to him to be repaired. Prisoner pleaded that he took the watch with several others to Birmingham, and there got into bad company and had them stolen from him. As he had been previously convicted on a similar charge, he is now engaged on a nine months' period of hard labour.

ALFRED WILLIAM STONE committed suicide at Cheltenham the other day. He was a watch and clock maker of that town, but for the last few months his business had been going very badly, and he became very depressed in spirits. On his little boy returning home from school, he found his father in the kitchen in a kneeling position, his throat cut with a table knife. The little boy ran for aid, but it was of no avail. The coroner returned a verdict of "suicide while in an unsound state of mind."

Transatlantic Jottings.

American Commerce.

ONE of the most important documents published lately was the quarterly report of the Bureau of Statistics of imports and exports of the United States for the three months ending September 30, 1890, issued about the middle of March, from which we select the following as being of special interest to our readers :—

	Quarter Ending Sep. 30, 1889. Dols.	Quarter Ending Sep. 30, 1890. Dols.
Imports of Foreign Manufacture.		
Unset precious stones and imitations ..	3,729,710	5,240,048
Jewellery, gold and silver ware	369,712	507,612
Watches, parts of, movements and materials	413,972	506,176
Bronze manufactures	215,380	223,570
Clocks and parts thereof	132,539	159,675
Diamonds, rough, and glaziers' diamonds	23,194	124,123
Exports of Domestic Merchandise.		
Clocks and parts thereof	320 211	308,285
Jewellery and gold and silver ware ..	124,738	174,475
Plated ware	115,391	110,436
Watches and parts thereof	55,951	76,1 5
Exports of Foreign Merchandise.		
Precious stones and imitations, unset ..	—	4,698
Jewellery and gold and silver ware ..	1,790	1,547
Watches, materials, etc.	832	250
Clocks and parts thereof	70	11

These figures speaks volumes, but want of space forbids our going far into them. We see there is still a very rapidly growing and extensive consumption of goods in the American markets ; in no instance is this more marked than with uncut precious stones, which show an increase of over 500 per cent. This is not very favourable, as it shows how much more cutting is being done in the States. With cut stones, however, the outlook is more pleasing, showing the remarkable increase of nearly 50 per cent., the figures going into millions, whereas the others are only tens and hundreds of thousands. It speaks in no uncertain sound as to the growth of their appreciation and consumption of gems. Turning to watches and clocks, we feel that either their home consumptions must be enormous or the output of their factories very much exaggerated, the whole quarter representing only a few days' work of some factories. We also hope our Canadian brethren, especially those who are advocating Transatlantic dismemberment of the Empire, will profit by the perusal of the other parts of the report.

* * *

IF the McKinley Tariff Bill is disliked and bemoaned in England, there are also very many who dislike it in the States also; indeed, several large mercantile houses have brought actions to test its *constitutionality*, but they could hardly be expected to get a verdict, however good a case they have. Its effects in Germany are more obvious than in England, where the falling off in the exports for the first three months of this year is 10,000,000m.

* * *

ANOTHER instance has lately been afforded of the necessity of watching the law-making of one's country. Just previous to the adjournment of Congress, a law was passed which renders the defacing of United States coins in the manufacture of jewellery a misdemeanour, with punishment of a fine of 100dols. The Act is being enforced.

* * *

YOUNG DUNCAN, who absconded in January last with 30,000dols. worth of diamonds, the property of Messrs. Lewisohn and Co., Maiden-lane, is traced to having gone to a hotel, the Astor House, and registered as E. Valdoz, St. Louis, where he deposited the diamonds in the safe. They were wrapped up in an old sock, and tied up loosely in a box. Want of room in the safe suggested that this valueless-looking parcel should be removed, which then revealed its contents. He sold 2,000dols. worth of the diamonds for 1,200dols. with which he has escaped. Needless to say, he has not yet returned to the hotel.

* * *

THE Missouri Onyx Mines are to be worked by a company with 300,000dols. capital. Recent analysis of the "Onyx" shows it is in no way inferior to the finest Mexican and Algerian : its hardness being between 3·6 and 4 (Moh's scale), highly translucent, and over 99 per cent. carbonate of lime. With the number of workings now known we may expect large quantities of this beautiful material in the market.

* * *

THE Souvenir Spoon Craze is at its height in all cities throughout the United States. Every city—and almost every firm, I was going to say—has its souvenir spoon, and English establishments may expect to do a good trade in them this season if they will only provide them. If not City spoons, they can easily provide national spoons with Shakespeare, Milton, Chaucer, etc.

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THE Owles Aluminium Company have reduced the price of the metal to five shillings a pound. At this price it is possible to apply it to bicycles and a thousand other things, where lightness and strength is the great object.

* * *

AN American lady has recently bought for 76,000dols. the diamond necklace which Ismail Pasha gave to the Empress Eugenie, on the occasion of the opening of the Suez Canal.

Round the Watch Factories.

ALL the large factories are now running full time and increasing their daily output.

The Kinsha Watch Case Company, of Wisconsin, have increased their capital stock from 100,000dols. to 200,000dols.

The Olay watch factory is about to move to Los Gatos, Cal. The company guarantee their railway watches not to vary two seconds in a month!

The Dueber Watch Case Company will soon be running as large a force as before the assignment. It has turned out a rather expensive job for John C. Dueber, assignee Douglas claiming 20,000dols. for his services; this has been cut down by the Probate Court to 12 000dols.

The Elgin Watch Case Company have just set up what are claimed to be the largest pair of rolls known, being fifteen inches in diameter.

The United States Watch Company are turning out one hundred movements a day, with 160 employés.

Messrs. Hurst and Co., Chicago, are reported to have given an order for 20,000 6-size Hampden movements to be delivered before the 15th May.

Scientific and Otherwise.

Pearl Fishing in the Poamotus.

AMONG the guests now at the Palace Hotel, San Francisco (writes the *Jewellers' Review*) is a young man named Samuel Harris, who has had quite a romantic career during the past four or five years. Harris was born and reared in that city, but his home is now in the Poamotu group of islands in the South Pacific. After he was graduated from school he went to Tahiti and engaged in trading there, but met with indifferent success. About four years ago he left Tahiti in disgust and went to the Poamotu group. Harris settled on the islands, where are located the chief pearl fisheries of the South Seas, and became very friendly with one of the principal chiefs. Soon afterward the chief took him into partnership in his pearl-fishing enterprise. He made regular trips to Otaheite to dispose of the pearls, which he did at such prices that he was more than satisfied. Finally Harris got to be known all through the South Seas as the "Pearl King." He amassed quite a fortune and decided to pay a visit to the city of his birth.

A Gigantic Cluster of Diamonds.

UP to the present, even in the South African mines, where the diamond is by many supposed to be in its original matrix, the King of gems maintains his royal dignity according to the Indian idea in celibacy, like a *recluse* cut off from all direct contact with his fellows. We certainly have seen here and there a large diamond, which a crystallographer would regard as being composed of innumeral twins, but at the same time they would probably cut into single stones, nothing of the nature of what might fairly be considered a cluster having ever been seen. News is just to hand of a Mr. Jacob Smith, of Homestead, who, on U.S. Government service to Brazil in 1886, found a large and curious stone, which he has since kept put away. The story goes that recently he noticed "a peculiar change which nature was working in the stone, turning it into thousands of brilliant points"; by this we can only suppose that the interspaces were originally full of some decomposed talcous or ferruginous material, which has since fallen out by dryness or weathering; at any rate, upon trying it with a file he found he was unable to make any impression upon it. He then submitted it to Professor D. Lewis, of Duncannon, Pa., who pronounced it to be a cluster of diamonds worth at least £280,000. We do not wish to depreciate the professor's appraisement, but we hope Mr. Smith may get it.

Discovery of Diamonds in Lapland.

THERE are several circumstances of recent occurrence that prompt us to look towards the regions of eternal snow for things undreamed of a short time ago; notably, two or three scientific journeys lead us to expect any day to hear of discoveries in payable quantities of diamonds, emeralds, chrysoberyls, phenacites and numerous other gems, as all these are known to exist on the proposed route of the Eur-Asiatic Railway. M. Charles Rabot, in a journey last year in Swedish and Norwegian Lapland, found some diamonds in the river Pasvik, on the Norwegian and Russian frontiers, but they were only very small, and whatever glowing descriptions are made from them they are no value commercially; but scientifically they show diamonds exist in the higher reaches of the river. They are accompanied by other gems and minerals, which do not occur in the diamond mines of South Africa, so that it is probable the river cuts through more than one kind of gem deposit.

The Mineral Wealth of Australasia.

A REPORT is current that a great discovery of platinum has been made in Australia yielding four figures to the ton in an ore that was not previously suspected to contain it. With our experience of Mount Morgan, where gold similarly existed, we are obliged to suspend judgment, but at the same time we think we should have heard more about it if this really had been the case.

A new discovery of silver lodes has been made 92 miles off Strahan and Flannagan's flat near Mount Sorrell, Tasmania. An assay of the specimens is said to have yielded 129oz. of silver per ton. There were formerly some gold workings in the locality, but they were abandoned as unpayable, and the existence of silver then was unthought of. Around Mount Sorrell are thousands of acres of mineral country as yet untrodden by white man.

Properties adjoining the Broken Hill are being developed, and showing remarkable results, as high as 1,100oz. to the ton as an average for ten tons. Rich gold discoveries are reported from Mount Hill, Greenough, Western Australia.

Great Jewel Robbery in the Transvaal.

IN February last, the premises of Mr. Simpson, Johannesburg, Transvaal, were broken into and £3,000 worth of jewellery stolen. In connection with the robbery two men were arrested, and two were believed to have made their escape over British territory. After the arrival of the steamship *Umballa* in the London Dock from Port Natal, a young man named Walter Scott, who gave his age as 21, and his occupation as an engineer, on being searched, was found to be in possession of 23 silver watches, which were sewn up in his shirt sleeve. He stated they were given him by the second steward to bring out of the dock for a second-class passenger; this led to the arrest of the second steward. The watches were afterwards identified as being part of the Johannesburg robbery. It does not appear that Scott was taken into custody immediately, but by Detective Cumner, at the Albion Hotel, Blackfriars, where he was found in bed. Under his pillow were found some nuggets of gold and watches, one of the latter being marked "Simpson, Johannesburg." Prisoner then attempted to bribe the detective, but he very laudably replied, "We don't do business like that here." Prisoner and his luggage were then conveyed to Leman-street Police-station. In his box were found a large number of articles of jewellery amounting to about £2,000. The prisoners were then remanded, and brought up again together with a stowaway on April 8th. Mr. St. John Wontner prosecuted. He said he had communicated with the Colonial Office, and was waiting for a reply. He wanted to hear if the Government would send Scott back in order that he might be tried with the others, now in custody, at Johannesburg. It might not be in the power of the Government to send him back, but there had already been several similar cases in point. If the authorities could not do that, then it would be his duty to take other steps to prevent a gross failure of justice. He had asked the Chief Commissioner of Police if he would be willing to keep the property; but, in any event, the wife, who held her husband's power of attorney, would be able to sue the police or the prisoner Scott, and the Court of Chancery would readily grant an injunction to prevent the jewellery from being parted with until the case had been settled. His client would then ultimately regain restitution of the property by action of law. If Scott could not be sent back, then the case would have to be dealt with as one of unlawful possession under the Police Act. Mr. Dickinson said the difficulty in this case was that Scott was taken into custody in a house, and it had been held that the Police Act did not apply to such a case. On a re-hearing, the magistrate ordered the prisoners to be discharged from custody.

John Harrison.

By James U. Poole.

On the 24th of this month, 115 years will have elapsed since John Harrison departed this life, at the advanced age of 83; and although the centenary of his death was not noticed in scientific circles, it certainly was of sufficient importance to have been thus distinguished. There is thus the more reason for recalling some of the more interesting facts about him on the present occasion, when several of his productions are about to be forwarded from the Royal Observatory to the approaching Royal Naval Exhibition at Chelsea. It is not my intention to attempt to give anything like a biography of Harrison, but to confine myself to the history and performance of the celebrated instrument for which he received the Government premium of £20,000 offered in the year 1714. Often as this instrument has been written about, it has never yet been quite correctly described, from the fact that most writers have not seen it, and others have not had the opportunity of closely inspecting it. Having recently had it entrusted by the present Astronomer Royal to my care for the purpose of cleaning and examination, I feel in a position to write with some confidence on the subject, and also think that I can explain to a considerable extent the reason of the very great unpleasantness which took place between Harrison, the Board of Longitude, and the Astronomer Royal of the time.

The instrument is known as Harrison's fourth timekeeper (some writers have erroneously styled it the third); it is the first which he made in a portable form, the others being more in the form of clocks, in cases some 2 feet square. It is contained in a double silver case 6 inches in diameter, and, although popularly styled a "chronometer," is really only a verge watch. The seconds' hand is in the centre, and, from the construction of the escapement, moves in a tremulous manner, which is not convenient for observation. Modern chronometers beat half-seconds.

The three chief features in the instrument are the going fusee, the compensation curb, and the remontoire train. The importance of the first two cannot be over-estimated, but the value of the last is doubtful, although it appears to have been the leading idea in Harrison's mind.

Looking back on his work, we consider in these days that his escapement was on a wrong principle, and that he started from a bad foundation in using it, apart from the difficulty of making it properly. It is affected, more than any other, by inequalities in the power of the mainspring, so he added the secondary force of the remontoire, in order to communicate a constant impetus to the escapement at intervals of seven and a half seconds. The ingenuity displayed in the arrangement is simply marvellous, but so much extra friction is introduced by the addition of the remontoire train that it is doubtful whether the extra force (which is imparted by the alternate coiling and uncoiling of a spring) more than counterbalances it. All the acting parts of the instrument are closely concealed by ornamental brass work, so that it is impossible to examine them without partly taking it to pieces, and I venture to assume that this was one cause why the Board of Longitude were prejudiced against the instrument when it first came before them. I must not omit to state, however, that the workmanship is perfect throughout, the wheels and pinions are beautifully cut, and the steel has been hardened and tempered in the most scientific manner possible, otherwise the pivots and springs would not stand the manipulation which is necessary to get them in their places. High polish has not been aimed at, but everything has been done with a view to utility. On the plate is engraved "John Harrison and Son, 1759."

In 1761 the instrument was sent for trial in a King's ship on a voyage to Jamaica and back, under the charge of Harrison's son, and the longitude having been determined within 18 miles (the maximum condition being 30), Harrison claimed the reward, but the Board of Longitude considered that further trials should be made. On August 17, 1762, Harrison was asked if he were willing that it should be tested at the Royal Observatory under the supervision of Mr. Bliss, the newly-appointed Astronomer Royal, but he decidedly objected to let it go out of his hands.

Finally, it was arranged that it should be sent on another voyage to the West Indies, and that he should previously deliver a sealed-up rate to the Secretary of the Admiralty. This he did on March 26, 1764.[*] Dr. Maskelyne, who the following year became Astronomer Royal, went out in the ship in order to observe the daily performance of the instrument, which performed admirably, and determined the longitude within 10 miles. The first half of the reward was then paid, but further conditions were imposed before the whole was promised—one being that an exact duplicate must be made by some one else. This task was accomplished by Larcum Kendall, Harrison's apprentice, who took higher ground with the Admiralty than chronometer makers are able to do now, as his stipulated price was £400, payable in advance, and he only undertook to make exact copies of the various parts without being held responsible for the performance of the instrument. This of course did not tend to make Harrison's production any more popular, but he said himself that he expected the cost in a few years would not exceed £100. It has been erroneously stated by several writers that this copy, by Larcum Kendall, was used by Captain Cook on his second and third voyages, the fact being that it has never seen actual service. Captain Cook's—made by Larcum Kendall in 1771—is constructed on much simpler principles, and has no remontoire action. I was entrusted with the task of cleaning it at the end of 1889 by the Council of the Royal United Service Institution. Unfortunately, the escapement is worn out. But to return to Harrison's. On the 5th of May, 1766, it was handed over by the Lords of the Admiralty to the custody of the Astronomer Royal, for the purpose of being tested at the Royal Observatory for a period of ten months, viz., to March 4, 1767. It fully sustained the reputation which it had gained on the West India voyages, as its rate in ordinary temperatures was exceedingly uniform—the first day of rating it gained 17·6, and the last 18·7; but when the temperature fell to 26° it gained nothing, which, unfortunately for Harrison, was the opposite to what he said it would do. It is a proof, however, that he had so far mastered the principles of compensation as to actually reverse the usual effects of cold on the going of a watch.

(To be continued.)

[*] Gaining 1 sec. daily.

The New Coinage.

Dr. John Evans, to whom we referred in connection with the Darwin medal, is now engaged with Sir John Lubbock, the Governor of the Bank of England, Sir Frederick Leighton, and Mr. Wade, in bringing out a new coinage. With such a selected body as this, each representing some special point which ought to be considered in the production of a new coinage, we may expect to get something to be proud of. We fear, however, there is something more to consider in connection with the currency than the production of an artistic and well executed coin. There are some deep problems which the sooner they are attacked the less probability will there be of unheard of disaster which must assuredly follow if meeting the exigences of the case is driven off too late. Do we ever try for a moment to realise what will become of the silver at the end of the Latin union, where will the hundreds of millions of gold come from to redeem the silver now held as security? What would be the result of an European nation having gold, as it is at Buenos Ayres, at a premuim of 235!

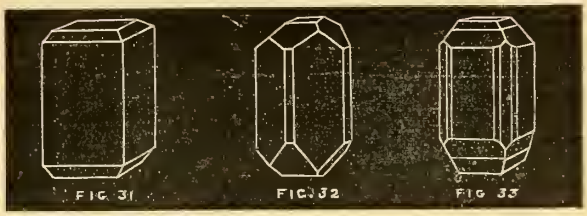
The Crystallography of Gems.

By W. J. LEWIS ABBOTT, F.G.S.

(Continued from page 218.)

THE DIMETRIC SYSTEM.

THE NATURAL FORMS OF IDOCRASE.



ALTHOUGH frequent reference was made in the last chapter to the characteristic lowness of the pyramid in Zircon, there is one other gem in which it is lower, and that is the Idocrase, or Vesuvianite, as it is sometimes called. In many respects its forms resemble those of the Zircon, but there are several features by which it is at once distinguished. Firstly, idocrase is usually striated along the length of the prismatic faces, something after the manner that obtains in tourmalines; its surfaces, too, are uniformly of a brighter lustre; and secondly, in idocrase, there is usually—in fact, almost always—present a basal plane at the extremities; whereas in Zircon the pyramids are not truncated in this manner, but meet in a point. Fig. 31 shows the simplest form of this gem; it is a plain square prism, doubly terminated by a single pyramid, which is truncated by the characteristic basal plane, or plane at right angles to the prism; both prism and pyramid are of the same order. Fig. 32 introduces us to complications somewhat similar to those met with in the Zircon, for in this case the prism is eight-sided, being composed of planes and prisms of the first and second orders, doubly terminated by pyramids of the first order, but truncated by the basal planes. It will be observed that although the second order prismatic faces are much more developed than those of the first order, there are no corresponding pyramidal faces, those of the first order meeting each other.

Fig. 33 shows an increase of complication, for in addition to the faces of the two orders of prisms, we have di-tetragonal faces present, adding eight more faces to the prism; and the pyramid, although of the first order, rises in two steps. In all three of these figures the pyramid, by coincidence, has been of the same order. It might just as likely have been of the other, or mixture of the two, with or without the addition of pyramidal faces of the di-tetragonal pyramid. When several of these different faces are present, they give the specimen quite a facetted appearance; sometimes there are over a hundred of these present in a single crystal. Usually crystals are bi-laterally symmetrical, *i.e.*, all faces developed on one side are developed on the other three. But this is not always the case; a prism of the first order may have two of its angles replaced by planes of the second order, giving rise to a six-sided figure; the two sides meeting the back at right angles, but in front looking like half an octagon.

There is another mineral sometimes regarded as a gem that crystallises in this system, viz., rutile. It is one of those that apparently shoot through quartz to form the *flèches d'amour*, "love arrows," or "Cupid's darts." In the latter case they are usually very straight and very thin, more so, probably, than tourmalines or topaz, which occur in a similar manner; when occurring singly they usually turn in a very zigzag manner, almost like the Greek key pattern.

(To be continued.)

Key for the New Courts, West Bromwich.

THE column of the key referred to last month for opening the new Law Courts, West Bromwich, is reeded after the style of the building with encircling bands and foliated capital. The head forms a rich quatrefoil, with grooved mouldings and edges, occupied at intervals with floral bosses, the upper curve of quatrefoil being crowded with a mural coronet. The interspaces of quatrefoil are occupied with a finely carved gold scroll springing from the centre shaft. In the centre are the arms of the borough in *champ-levé* and painted enamels, the crest being above, and the motto in raised gold letters on the lower curve of quatrefoil. The reverse has the following inscription on a shield similar in size to that on obverse:—"This key was presented to E. W. W. Heelis, Esq., J.P., Mayor, by the Town Council, on the occasion of the opening of the Law Courts, West Bromwich, April 14th, 1891.

PRESENTATION TO MR. GEORGE HALFORD, F.C.O.

Another very fine piece of work by the same firm, Messrs. T. and J. Bragg, of Birmingham, is a very beautiful ivory bâton, decorated with gold mounts of an emblematic character, lately presented to Mr. Halford, the conductor of the Birmingham Choral and Orchestral Association, by the congregation of St. Michael's, Handsworth, on his retirement from the post of organist and choir-master of that church. The conventional emblematical cross, with circle and band, occupies the upper portion, and upon the outer band are the words "Saint Michael and All Angels." Beneath this comes a harp upon a large gold shield which bears the following inscription:—"Presented to G. J. Halford, F.C.O., by the members of St. Michael's Church, Handsworth, as a recognition of ability and services rendered as organist and choir-master, 1885-1891." Other bands have an organ enwreathed, musical score, and emblems of the conductor and choir. At the top of the bâton is the enamelled monogram of the recipient, in three colours.

NOTICE TO THE TRADE.—We have received the following from Messrs. O. Berend and Co., 61, Fore-street, E.C.: "We regret to have to inform you that our letter box having been systematically plundered for some months past, many letters, orders for goods, cheques and post office orders have never come into our possession. As we have reason to believe that some hundreds of letters have been destroyed, and we have no clue to the writers, we trust that you will publish this explanation to account for any delay in attending to inquiries or communications which may have been forwarded."

AMONGST the list of passengers per *Arawa*, just arrived from New Zealand, we noticed the name of Mr. D. E. Theomin, head of the old-established house of D. Benjamin and Co., wholesale jewellers and importers, Dunedin, so well-known to manufacturers under the mark "500." Mr. Theomin's London address is care of Messrs. Michaelis, Hallenstein and Co., 17 and 18, Basinghall-street, E.C.

Hall-marking of Silver Plate, with Special Reference to India.

(Concluded from page 222.)

A Paper read by the Society of Arts, January 22nd, 1891.

By Edward J. Watherston.

The Continent.

LATELY there has been published a Parliamentary paper entitled "Foreign Countries (Gold and Silver Marking)" which should be of great interest to British silversmiths. We are now in possession of all the facts relating to the laws and regulations with regard to the manufacture and sale of plate in Austria, Hungary, Belgium, Denmark, France, Germany, Italy, Holland, Portugal, Russia, Spain, Sweden and Norway, and Switzerland. A glance at this report should show manufacturers why our export trade is so limited. During the last fourteen years, our total exports to all countries have averaged only 92,569 ounces per annum, and the "Statistical Abstract" tells us that our exports to the Continent have been a mere bagatelle, a fact attributable alone to the impolicy of our Hall-marking laws. It is now on record that foreign standards all differ from ours, and, for the most part, theirs from each other, and that most countries have strict Hall-marking systems of their own, based, of course, upon their own standards. Therefore, foreigners want neither our standard nor our Hall-mark. In no Continental country is the tariff in any degree prohibitive. In France the duty upon imported silver plate is exactly the same in amount as that levied upon home-made work about 6½d. per ounce, including the Hall-marking fee. Finished goods are marked by the ‘touch." With but few exceptions all the standards are lower than ours. Even those exceptions are a disadvantage to this country. France marks ·800 and ·950, so British goods, being ·925, are re-marked in France with the stamp denoting the lower standard. In Austria our plate is re-marked as ·900. But the great point of interest to British silversmiths is to be found in the fact that, however strict foreigners may be with regard to plate exposed for sale in their own country, with the exception of Holland, Portugal, Russia, and Switzerland, they all permit their manufacturers to make anything they like, of any quality ordered, for exportation, and Russia encourages exports by remitting half the Hall-marking fees.

So the British position is this: foreigners may make what they like for us, and, provided it be ·925, it can be imported into this country and can be Hall-marked at an expense of a few pence; or, if it be for private use or of "Oriental" design, it can be imported of any quality free from any obligation of assay; whereas the British silversmith cannot make an ounce of plate for a foreigner unless he be prepared to take our standard and our Hall-mark. Dealers in the United Kingdom may buy and expose for sale foreign-made plate, which, "in the opinion of Her Majesty's Commissioners of Customs" is of "Oriental" design, without the obligation of Hall-marking; but if a manufacturer in this country make exactly similar plate, he and the dealer are to be fined £10 each, unless such wares be Hall-marked. Imports here are permitted and encouraged; exports practically are prohibited—at all events, are permitted only under conditions as render trade in many instances impossible. The impolicy of this practice, I think, is undeniable. If there be one thing more than another which shopkeepers desire to conceal, it is the orgin and locality of manufacture. Shopkeepers abroad might be induced to give large orders to British manufacturers, but when they got possession of the goods they would be very unlikely to proclaim them as British. They would get them marked in France, Russia, Austria, or elsewhere, and sell them as of their own production. Hence a natural objection to the British Hall-mark. The policy of this country, as it seems to me, is to encourge all business which shall provide work for our workpeople, and to make for foreigners anything that they may be disposed to order.

(To be continued.)

Mayoral Chain and Badge for Bishop's Castle.

A VERY handsome gold badge and chain has just been completed for the ancient Borough of Bishop's Castle, which has recently renewed its charter under the new regulations of the Board of Trade. The badge is generally circular with pendant ends and Renaissance scroll summit, having a number of ornamental finials at intervals round the border.

The seal of the borough is given in the centre in elaborate style of enamel painting—the castle with portcullis and bomb proof towers, these latter having, upon the centre one the Union banner, and at the sides the St. George's Cross, while on either side of the centre tower are the letters "J.R." (James Rex), and the date 1609 appears below on a green sward in front of the castle.

The Silver Trade Pension Society.

WE have much pleasure in reporting the fifty-fifth annual meeting and election of Pensioners of this society, which was held at the Holborn Restaurant. There was a large gathering of subscribers and friends. Mr. James Garrard presided, and was supported by Messrs. Francis B. Thomas, James Slater, Henry Pearson, and other well-known members of the silver-plate industry. The report stated there were sixty-one annuitants on the funds of the society, viz., thirty-four women and twenty-seven men. The Chairman, in moving the adoption of the report and balance-sheet, expressed his pleasure at the amount of good that had been accomplished in granting annuities to the aged and infirm members of the trade; but he urged that still more might be done, both by the employers and employed, to provide large funds, and so extend the usefulness of the society. Mr. James Slater, the treasurer, stated, in response to the chairman's appeal, he would have pleasure in giving £100 to the institution, an announcement which was greeted with great applause by the subscribers present. The office of the society is 30, Theobald's-road, from which address the secretary would be pleased to forward particulars of the society. We often feel that the trade societies are not sufficiently known; instances have come across us again and again where members of the trade have been trying all in their power for years to see if there were any institutions connected with the trade, and if so, what was their nature, and when did they meet.

We regret to record the death of Mr. W. J. Livock, watchmaker, of Diss. The event took place under somewhat distressing circumstances, the deceased succumbing to a sudden attack of inflammation. Mr. Livock was for many years manager to the late Mr. A. F. March.

Mr. Nethercott, jeweller, has sustained a loss of about £300 by fire. The members of Mr. Nethercott's family had a narrow escape. A small fire has also occurred on the premises of Mr. J. W. Sewell, watchmaker, Grantham.

A large quantity of jewellery was recently stolen by thieves from the premises of Mr. Robert Looney, Whitby-street, West Hartlepool. The jewellery has since been recovered, and the offenders convicted and sentenced to various terms of imprisonment.

Watch and Clockmakers' Asylum.

ON Wednesday, April 8th, the Right Hon. the Lord Mayor gave another illustration of how he intends to do all he possibly can for the interests of the charities of the trade during the term of his high position of chief magistrate, in presiding over the dinner for the benefit of the Watch and Clockmakers' Asylum at New Southgate, which, through the further kindness of the Master and Court of the Goldsmiths' Company, was held at Goldsmiths' Hall. The Chairman was supported by Mr. Sheriff Harris and Mr. Sheriff Farmer, Sir Polydore De Keyser, Captain Penton, M.P., Mr. Gainsford Bruce, M.P., Mr. J. J. Goode, J.P., the Rev. J. H. Rose, M.A., Mr. T. Baxter (president of the society), Mr. T. Taylor (secretary), Messrs. G. Antill, J. D. Spires, E. J. Thompson, P. Woodman, J. Knight, J. S. Jennens, Betjemann, T. Dyson (Mayor of Windsor), E. Spring, T. Vine, John Passmore, Wilkinson, Charles Hearson, W. E. Hearson, E. A. Carpenter, J. Poole, W. Barnsdale, R. W. Cole, J. Usher, G. Bruton, F. W. Clerke, L. Donne, S. R. Ayres, A. Baume, W. Potter, J. Potter, F. Clerke, J. Arnold, D. Clarke, R. M. Marples, J. A. Clemence, C. Reepe, W. Barnsdale, J. Thwaites, H. M. Gaydon (vice-chairman of Asylum Committee), S. A. Brooks, and many others.

After the usual loyal and patriotic toasts, Mr. Sheriff Farmer proposed "The Army and Navy," to which Lieut. L. Antill replied. Sir Polydore De Keyser proposed "The Houses of Parliament," Capt. Penton, M.P., and Mr. Gainsford Bruce, Q.C., M.P., responding. The Mayor of Windsor (T. Dyson, Esq.) proposed "The City Companies," the Prime Warden of the Fishmongers' Company replying.

The Lord Mayor, in proposing the toast of the evening, "Prosperity to the Watch and Clockmakers' Asylum at Southgate," said he knew from their presence there that night that they had been interested in the object on whose behalf they had met; and, therefore, he felt he was speaking to a sympathetic audience. But he hoped that, before concluding his remarks, to have enlisted additional sympathy with regard to the important objects for which he was to plead. That institution was established some 40 years previously by some benevolent men connected with the trade, who felt that there should be some suitable provision for those decayed members of the craft, who by some ill fortune or accident were unable to procure the comforts of life which they would wish. This institution at New Southgate was established to provide habitation, light, fuel, and pensions for the aged and infirm of the trade and their widows. A grand and noble work had been done in those almshouses for the past 40 years. They all knew that in the various walks of life all did not succeed, and some were obliged, when adversity came upon them, to fall back upon the kindness of their friends, or the poorhouse would be their portion. He knew that those who were members of the craft felt special interest in those almshouses; but he contended those almshouses had a claim outside the craft. Everyone who had a watch in his pocket, or looked up at a clock in order to catch a train or be in time for dinner—(laughter)—owed some debt of gratitude to the clock and watchmakers. He thought he could confidently ask for support from every citizen, and from every inhabitant of the Empire, for members of that scientific trade in the declining years of their life. There was no doubt that the trade of the watch and clockmaker was very trying to not only the eyes, but to the system generally. It involved great confinement for those who laboured in it; and it was oftentime the case that their labour was not remunerated to the extent of allowing for a provision for help and comfort in their declining years. At the present time there were in the almshouses six women and sixteen men. The men received £24 per annum, and the women £15. And that night the committee hoped, by the generosity of gentlemen present, to be enabled to increase the accommodation at the asylum. At the present time, if a poor man died in the asylum and left a widow, that widow was not, according to the rules, allowed to remain in residence, unless under exceptional circumstances, as a consequence of which she frequently had to go to the workhouse. What the committee desired to do was to build additional accommodation expressly for widows. (Hear, hear.) He was told that at the last payment of pensions the chairman was obliged to advance money to enable the committee to meet the demands, and, therefore, there were several grounds upon which he relied for their support. It was seven years since a similarly public appeal was made; and on that occasion the dinner was presided over by his relative, Sir Robert Fowler—(applause)—in response to whose appeal there was a subscription of £600. (Applause.) Now he (the speaker) hoped to see the total up to £1,000. (Hear, hear.) Major Lambert had generously sent a cheque for 100 guineas—(loud applause)—the Goldsmiths' Company had acted liberally by being annual contributors to the extent of £300—(hear, hear)—and he hoped all present would liberally support the committee that night.

Mr. E. J. Thompson, who was described on the list as "one of the founders of the institution," replied, and deprecated the description that had been given him, because he was only one of the humble 12 who, just 40 years ago, met and supplied the means for taking the initiatory steps for what was now a valuable and progressive institution. But they were not the first institution of the kind, because as far back as 1815 they had a pension society to assist decayed members of the trade. And good had indirectly resulted from this; for in one large printing establishment in the City the men had said if such a thing was possible with one trade, it was with another. With very great pleasure he had seen what the committee had done for the benefit of the asylum, and he mentioned in particular the names of Mr. William Rowlands and Mr. George Moore. (Applause.) He would like the Lord Mayor to go down and see the asylum at New Southgate. Captain Penton, M.P., had been down there, and been impressed with the comfort of the pensioners and the beauty of their surroundings. The watchmaking trade of Clerkenwell and St. Luke's had been suffering for a considerable time from depression, and were not in the position now, as they were 30 or 40 years ago, to maintain their benevolent institutions. The simple and homely arrangements at the asylum were very striking, and whilst the committee would like to amplify the allowances to the inmates, there was still sufficient to keep them in comparative comfort, and in an independent manner. He asked all to open their hearts and give liberally towards such a deserving institution.

Mr. Thomas Taylor (secretary) now read out the subscription lists, which included 10 guineas from the Lord Mayor, 20 from Captain Penton, M.P., five each from the Sheriffs, three from the Hon. Dadabhai Naoroji, 10 from Mr. E. J. Thompson, the grand total of the evening (including Major Lambert's 100 guineas), being £645.

Mr. Foster then proposed "The Health of the Lord Mayor," in suitable compliments. The Lord Mayor, in responding, observed that he really felt it a privilege to plead on behalf of such a grand institution.

Mr. D. Clarke proposed "The Visitors," and Mr. J. Manger replied.

At this point the Lord Mayor left the chair, and his position was taken up by

Sir Polydore De Keyser, who at once proposed "The Health of the Chairman of Committee, Mr. Thomas Baxter." This was received with gratifying applause, the company singing "He's a jolly good fellow."

Mr. Thomas Baxter returned thanks, and said the asylum had always been his pet hobby, and the committee had honoured him by making him their president.

Sir John Bennett, Limited.

THE facts presented to the shareholders of Sir John Bennett, Limited, at the second ordinary general meeting, held on April 14th, at Keenan's Hotel, Crown-court, Cheapside, revealed a rather unexpected state of things. Mr. Edwin L. Moore accepted the by no means enviable position of chairman, and addressing the meeting he said the result of the year's trading had not been so satisfactory as the directors could have wished. Their esteemed chairman had died, and the company had lost the services of Mr. T. R. Russell. From personal experience he (the chairman) knew the past year had been without exception one of the worst known for the last twenty years. He proposed the adoption of the report and balance-sheet. Mr. James Inch seconded the proposition.

Mr. John Aldy said that when the company was taken over the profit on the business was stated to be £8,000 a year. The company had only been in existence two years, and the profit had dwindled down to £1,500. In his opinion the falling off of profits was not due entirely to bad trade. He wished to know what the turnover was when the concern showed a profit of £8,000, and what it was last year. He noticed by the report that the trade of the watch and clock department had been fairly good during the year. If that were so, the losses had been made in the jewellery department.

Sir Joseph Weston complained of the management of the company from its inception. First of all, the directors took over the business without any disinterested valuation. They were paying Sir John Bennett £600 per annum without receiving any of his services, which he thought a very unsatisfactory arrangement. He thought, after the results of the past year, they should in justice to themselves appoint a committee of investigation—(hear, hear)—in order that the business of the company might be looked into.

Mr. Horton said that it was time something was done, and it seemed to him that Sir John Bennett had gone out with the plum, and the shareholders were left with the stone. He could not understand why Sir John was not paid the whole of his purchase money in "B" shares, and then he would have taken his fair share of the risk.

Mr. Lofthouse complained of the unsatisfactory character of the balance-sheet.

Sir Joseph Weston moved "That this meeting be adjourned, and that a committee of the shareholders be appointed to make a full investigation into the affairs of the company, and to make their report to a general meeting to be called by the board when the committee's report is ready, such committee to have full power to investigate thoroughly the books and position of the company, and to call any legal or other assistance at the expense of the company." He said that he was not animated by any hostile spirit to the directors in moving that resolution. His only motive in doing so was because he felt that the affairs of the company had fallen into such a condition, that it was necessary that some steps should be taken with the view of seeking to extricate it.

The amendment was seconded by Mr. North, and carried unanimously.

Subsequently a committee, consisting of Sir Joseph Weston, Mr. Baume, Mr. Lofthouse, Mr. Hewitt, and Mr. Bishop, was appointed.

The Chairman then proposed the re-election of Messrs. James Inch and George Hendry as directors of the company.

This was seconded by Mr. Mole, and carried.

On the motion of Mr. Warman, a vote of thanks was given to the chairman and board, which terminated the proceedings.

The Trade of the Country.

WE regret we have several times been informed that a great deal of German jewellery of a very inferior quality is coming over in the rough state, and being made up and sold as English; we should therefore recommend buyers to beware of this.

* * *

Tabulating the reports received from the majority of London houses we should conclude that trade might be called fair. A large number of firms are satisfied, while some complain of the paucity of business. Many London wholesale houses report good sales around the country, but at the same time find money a little tight.

* * *

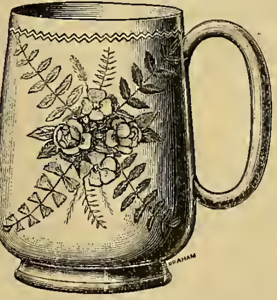
Mr. George Kenning, of Little Britain and Aldersgate-street, whose name is so inseparably connected with all that is Masonic, has now a branch establishment at 16 and 16a, Great Queen-street, W.C., opposite Freemason's Hall, for Masonic jewels and clothing. It must be remembered that although Mr. Kenning does the largest retail business by far of any in the trade with his brother Masons and various other orders, he has greater facilities for supplying the specialities wholesale than any other house in the trade. Good trade discounts off catalogue prices are allowed.

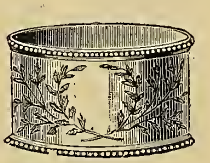
* * *

Mr. J. J. Stockwell, 6 and 8, Charter-street, Clerkenwell-road, has taken further premises in Charterhouse-buildings for storage, to meet largely increased business. He is very busy, and has some important export orders on hand.

* * *

Messrs. R. Pringle and Co., Clerkenwell-road, attribute a large amount of their increased trade to the repeal of the silver duty. They even find at the present moment it is quite a difficulty to get sufficient hands for the class of work they are turning out, such as apostle and fancy spoons, silver mugs, serviette rings, and such like articles. They also issue a well-illustrated catalogue, without prices filled in, which can be shown to customers, from which we select the two subjoined.





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Messrs. Plucknett, of 29, Poland-street, have recently enlarged their premises and gone more extensively into chain making. Their metal alberts are of very good colour and finish. In the sale of these they are very busy. We would especially call the attention of the trade to their recently patented saw-frame, by which the unscrewing and screwing every time the saw has to be taken out is done away with, and by a simple pressure of the thumb or finger on a lever the saw is released or made fast, the grip, which it is called, being practically everlasting. They can be fitted to old frames at a shilling each.

Perhaps the largest single order for plate powder ever received has just been taken by Mr. F. W. Powell, of Hatton-garden. The order is for seven hundred gross (100,800 boxes), and nearly nine tons of powder will be required to execute it. The powder is known as "Chancellors," and has only been on the market about eighteen months.

* * *

Turning to Birmingham, in the general report good trade predominates, although certainly a number of houses are complaining very much that usually enjoy a large share of the trade.

* * *

Mr. F. Derry, of 11 and 13, Hockley-street, Birmingham, has issued two new pattern books of all kinds of boxes in electro-plate and silver, and other electro-plate wares. He has on hand some contracts for sport prizes.

* * *

Messrs. J. Allday, of 8, Warstone-lane, Birmingham, find indents from foreign markets coming to hand. We might mention there has been a report current that the senior member of this firm, Mr. John Allday, senior, was dead. We are pleased, however, to say for his sake it was not him. Mr. H. Allday, his brother, however, has died recently.

* * *

Mr. W. H. Brown, 15, Great Hampton-street, Birmingham, finds trade good, quite up to the present average. Good orders for watches and materials generally are on hand.

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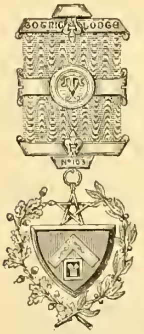


Mr. E. Vaughton, of the Gothic Works, Birmingham, reports good orders in Masonic jewels and jewellery from the Colonies and India, also for football medals and club badges for home trade. Mr. E. Vaughton is having prepared a lot of new designs of Masonic jewels, which include a new P.M.'s jewel. Mr. Vaughton has lately started a new die-sinking, stamping, and piercing department, at 135, Constitution-hill.

* * *

Mr. J. D. Benson, 10, Hylton-street, Birmingham, states that trade is decidedly bad; almost entirely owing to the weather. He presumes when people are settled down we shall have "a flush" of trade, and that business will be good this summer.

* * *

Mr. F. G. Kettle, of Kingsgate-street, W.C., reports that he is very full of orders, and is busy with many shipping lines.

* * *

Messrs. M. Willis and Son, of Exchange Works, Rockington-street, Sheffield, are very busy with general goods, such as teapots, cruet frames, breakfast cruets, butters, biscuit boxes, marmalade frames, spoons and forks, and all kinds of cased goods; and have orders on hand for special cups for prizes for bicycle sports, volunteers, and other silver goods for wedding presents. The firm has just arranged to purchase the premises now in use, as they are central and well-adapted for the business.

* * *

Messrs. T. and J. Bragg are still very busy, especially with the jewels and stars of the higher grades of the Primrose League—no doubt in view of the coming election. They have also on hand some important contracts for Masonic jewels. They are likewise extending their diamond set work.

* * *

Mr. Mayer Blanckensee finds trade certainly better this year than last. He still continues to bring out new specialities in gem jewellery in that class of work for which he has been so long celebrated. As there is a continued demand in the better class London houses for new designs in ladies' rings, we should advise all doing a really first-class trade to see Mr. Blanckensee's latest productions.

* * *

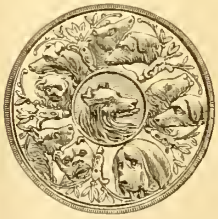
Mr. A. Sydenham, in addition to the numerous classes of goods with which he is associated, has nearly completed an illustrated price list of all sorts of cups, badges, and such like things, suitable for prizes. We should recommend all our readers to get his new lists, and also to see his goods.

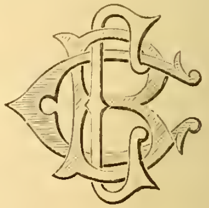
* * *

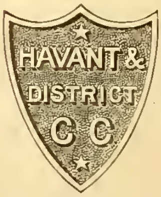
Messrs. J. Hare and Son have removed from 171, Hunter's-lane, to 1, Union-row, Soho-road, Handsworth, newly-erected and more commodious premises. They are busy with early English brass dials, which enjoy a good reputation in the trade.

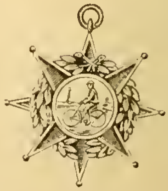
* * *

In a previous issue we made mention of the exhibits of Mr. A. Fenwick, of 16, Augusta-street, Birmingham, at the Cycle Exhibition recently held at the Winter Gardens. The illustrations we now give are selected from amongst those that attracted special attention, and of which we spoke before. The large medal for Dog Shows, made in either gold, silver, or bronze—or, for the matter of that, in any metal required—with an interchangeable centre, in order to adapt it to represent the particular breed of dog for which it may be awarded, is, when completed, a particularly good specimen of workmanship, displaying the care and attention bestowed upon these articles by Mr. Fenwick personally during the various processes of manufacture. His specialities are numerous, but the identical medals shown at the Exhibition are yet, we believe, to be seen at 16, Augusta-street. To those who are in the habit of catering for the supply of medals and badges to clubs, societies, associations, etc., one of Mr. Fenwick's illustrated catalogues would be useful; or, if possible, the expenditure of a few minutes to an inspection of the numerous specimens to be found at his establishment, and to the very moderate prices quoted. The lowness of price generally, we may say always assists largely, and goes a long way towards the





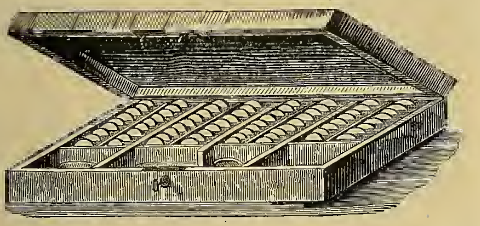




good reception of an article in these days of such keen competition, and more especially when the production can be depended upon to be of a superior manufacture.

* * *

Messrs. Taylor, manufacturing opticians, of Tenby-street North, Birmingham, while acknowledging the optometer to be useful as a rough and ready aid to testing the sight, hold that perfect accuracy is not to be gained by any form of optometer yet invented, and therefore strongly recommend their trial case, as illustrated. This is fitted up with all the sights ever likely to be required, both in convex and concave lenses, including cataract lenses, and a trial frame into which all the lenses in the case will fit, so that the actual lens or pair of lenses is tried on the customer, and the number of the focus being engraved on the lens, is simply copied, and order sent on for that number which will be an exact duplicate of those tried on the face. The case is handsomely finished in polished mahogany or walnut, and lined with crimson satin, and is sold to the trade complete at 55s., a price not much higher than that of the less expensive forms of optometer.



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The demand for cycles appears to be increasing daily. Many of the establishments of the Coventry manufacturers seem quite inadequate to keep pace with the rapid influx of orders. Messrs. Flavell and Co. have just removed into the large and commodious factory that has been in course of erection for some months past. The exodus from the old works would have taken place early in February, but owing to the severity of the winter building operations were very much delayed, so it was not until a week or two ago that they were enabled to make a clear start in regard to orders in the new building. The factory is fitted completely with all the latest type of machinery and tools, and is capable of turning out comfortably sixty machines weekly, or even a greater number if worked at high pressure. It is to be hoped that the supply will now be commensurate with the demand for the pattern of machine which this firm makes a speciality.

* * *

We hear from Whitby the new system of stamping and guaranteeing the quality of jet is received most favourably by the trade, and is certain to be even more so by the public. The pioneers of this reform, however, do not expect it will be supported by those firms in the trade who are solely or principally interested in foreign jet, neither by several of the London wholesale firms, as the latter purchase principally from small makers, who in most cases are not yet in a position to give the necessary guarantee, by each article bearing maker's trade mark; and as the penalties are so heavy (under the Merchandise Marks Act) it is probable the London wholesale merchants will hesitate before giving such a valuable guarantee on their own responsibility. This makes it all the more important that buyers who require the genuine article should purchase only those goods that bear the manufacturers' trade mark, as verbal guarantees have in most cases proved to be worthless. All buyers, both wholesale and retail, should be careful to note this fact.

Mr. G. S. Payne, of 131, High-street, Oxford, informs us that "those of our business situated in a strictly agricultural district find a good all round improvement. Price of produce has not been so good for ten years, hence profits of our country customers are better." The voice of Mr. Payne must be worth something, as he is probably one of the oldest, if not the "oldest boy" in the trade, as he has been over 60 years in it. He is an Alderman and a J.P. of Wallingford. He has recently taken his son, Mr. E. O. Payne, into partnership; his other sons and sons-in-law are also representatives of the trade in Tunbridge Wells, Hastings, Abingdon, and Oxford.

* * *

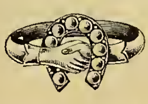
The effects of the strike in Scotland are now passing away, and Mr. Charles J. Hill, of Russell House, Coventry, is again busy with the watches bearing his "Forrest" trade mark.

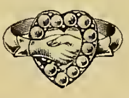
* * *

The output of the white-metal and gold cased albert and guard chains, manufactured by Messrs. Charles Baker and Son, of 90, Spencer-street, Birmingham, is just now abnormally large. This year's orders alone add materially to the number of these articles it is the boast of Messrs. Baker and Son to have "turned out." They promise one or two very interesting novelties for next month, which have only to meet with the extensive sale that attended the production of white-metal goods to amply repay the firm for the time and money expended in the preparation of the goods, in order to bring them up to the standard of their ideas.

* * *

Two extremely pretty designs are given in engagement rings. These are being manufactured by Messrs. Alabaster and Wilson. Each design is effective, and likely to prove very attractive to that portion of the retail trade that makes a speciality of the engagement ring.





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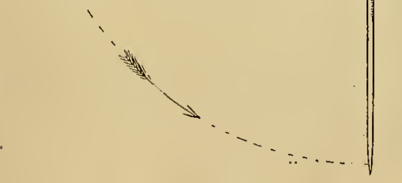
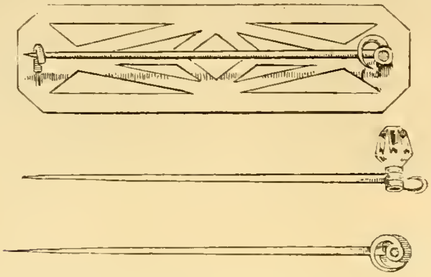
Messrs. Siecele and Bennett, of Charterhouse-street, Holborn-circus, have just patented an extremely ingenius brooch-pin which renders brooches safer than any other arrangement could possibly suggest. The pin cannot come undone, and can be attached to any ordinary brooch. The brooch, as will be seen from the accompanying designs, sits perfectly straight. The attachment of the new patent



to a scarf-pin shows that the pin can be applied to any ornament. The action is made by machinery so strongly that it is impossible for it ever to wear out or to get out of order. The great advantage is that an ornament cannot get lost or be snatched by thieves, even if the pin is not fastened to the catch, because the hook is fixed into the material.



Things New and Noteworthy,

A Useful Plate Powder. BEING used to a staff of plate polishers, and the ordinary methods and materials employed in polishing, does not prejudice one in favour of any of the various compositions that are sold as plate powders, and for a thing of the sort to receive anything like appreciation at our hands it must be something more than a quack medicine. We have lately received a small packet of plate powder from Mr. Henry Steer, an influential and prominent member of the trade at Derby, and we have no hesitation in claiming for it the quickest and sharpest action, combined with the smoothest and most highly lustrous surface of anything we have had the pleasure of trying.

* * *

Anti-Varnish Liquid. MANY a hair—which if retained might serve to cover the bald place that will sooner or later assert itself—is ruthlessly uprooted by fingers exasperated at the tarnishing of plate, especially in towns where sulphurous emanations exist; and exist they will, not only where those actions which are associated with chemical manufacturing are going on, but wherever human skins are bathed by an absorbing atmosphere, which more freely parts with its load to the silver, being assisted by the subtle force we call chemical affinity. As long as silver surfaces are left exposed, so long will combinations, resulting in those various dark hues we call tarnish, be found deposited. With other metals where colour is not of so much importance, recourse is had to lacs and varnishes; but this cannot be done with ordinary silver, as its colour is impaired thereby, but with the preparation *Silvastor*, which we have recently received from Mr. T. Holden, 17, Hargreaves-street, Burnley, Lancashire; all the advantages of a varnish are procurable, with none of its disadvantages and drawbacks. Unlike lacquer, it does not require the article to be heated, nor does it in any way change the colour of the metal, except by increasing its reflective powers, and hence rendering it absolutely whiter in appearance. We have used it in conjunction with the foregoing powder, and are charmed by the result.

* * *

New Watch-holder. THERE are few people who have not realised difficulty and annoyance in being obliged to raise themselves in bed to see the time by their watch. Wilkinson's patent watch-holder is intended to remedy this by having, in addition to the hook, which allows the watch to hang in a vertical position, another holder and a spring by which the watch is held in a horizontal position, face downwards, over the pillow. It is certainly a very simple arrangement, and most effectual and useful.

* * *

New Principle Sleeve Links. WE have received from Mr. R. Rubens, 112A, Bold-street, Liverpool, a sample of his new patent sleeve clip, which possess some very novel features. They may best be regarded as an extension of the idea of the springs in Dent's gloves, only instead of being single or V shaped they are double, and on a diamond-shape frame; they are intended to prevent the annoyance of shirt-cuffs dragging round the hands, and sleeve-fasteners getting under the wrist whilst writing. The cuff is held at any distance out of sleeve, or kept clean within. The peculiar, yet remarkably simple way by which the clip is attached, causes it to lie buried in sleeve lining until wanted.

* * *

Hook Brooch and Collar Fastener. MESSRS. DEAKIN AND FRANCIS, of 17, Regent-place, are the patentees of the hook brooch and collar fastener, as illustrated on the inside of our front cover. Whilst noticing the simplicity of the invention, and the absence of tong or catch to break, or joint to become loose, we marvel much that something of this kind has not made its appearance long ago, and displaced the somewhat inconvenient and imperfect contrivance now in vogue for fastening brooches. The liability to lose the brooch or ornament is greatly decreased by this method of securing to the dress or collar, at the same time drawing the ends of either well together and keeping them in their place. It can be effectually affixed to the thickest material without the slightest difficulty. It is obvious that this patent will be recognised at once by the wearers of brooches as an improvement, and become popular.

FOUR Huntington mills at the Pittsburg gold mines in Nevada are returning over 96 per cent. of the assay value of the ore crushed. This may be considered almost perfection, when it is remembered that with ordinary stamp batteries of the very best type 75 per cent. to 85 per cent. is the average yield, and with stamp batteries of inferior make the yield may go down to as low as 55 per cent. Taking the average of stamps at 80 per cent., 15 per cent. of gold saved or lost may mean the success or otherwise of a gold mine.

WILLIAM GODFREY (65), described as a jeweller and watchmaker, residing in Barnsbury-park, Islington, was charged at the Clerkenwell Sessions with stealing jewellery and precious stones of the value of £1,000 belonging to Mr. Abraham Norman, jeweller, Heddon-street, Regent-street. The prisoner was sentenced to eighteen months' hard labour.

ON the morning of April 2nd, a fire was discovered on the premises of Messrs. Marsh and Co., jewellers, 17, New-street, Birmingham. The Fire Brigade were promptly called, and it was then discovered that the fire was situated in drawers underneath a large case which contained some thousands of pounds worth of jewellery. The fire was quickly extinguished.

EARLY on the morning of the 2nd April, the shop of MM. Golay, Leresche and Sons, jewellers, of the Rue de la Paix, Paris, was broken into by burglars, who, taking advantage of the temporary absence of the watchman, stole several rings, brooches, and other articles valued at more than £3,200.

APPLICATIONS FOR PATENTS.

(*Expressly compiled and contributed for this Journal by* Messrs. W. P. Thompson and Co., F.C.S., M'sI M.E., Patent Agents, 6, Bank Street, Manchester; 6, Lord Street, Liverpool; and 323, High Street, London, W.C.)

4,632.—Walter Smedley, Ashover, Chesterfield, for "An improvement in watch keys." Dated 16th March, 1891.

4,640.—T. W. Airey and J. E. Airey, Doncaster, "Improved pencil suspender." Dated 16th March.

4,880.—Frederick Frey, London, "Improvements in watches" (complete specification). Dated 18th March, 1891.

4,899.—William Broad, London, "Improvements in solitaires and the like." Dated 19th March, 1891.

4,904.—John Harrison Turner, London, "Improvements in or connected with electric alarum clocks or timepieces." Dated 19th March, 1891.

4,954.—James Joseph Culley, London, "Improvements in cuff-holders." Dated 19th March, 1891.

4,973.—John Cornelius Wilson, London, "Improvements in checking or registering and indicating workmen's time or the like, and in apparatus employed therein" (complete specification). Dated 20th March, 1891.

5,144.—Charles Henry Moody, Crewe, "Calendar chronograph watch." Dated 23rd March, 1891.

5,192.—William Soule Scales, London, "Improvements in electric clocks" (complete specification). Dated 24th March, 1891.

5,219.—A. Stead and John Pearson, Bradford, "Improvements in date indicators applicable to clocks, watches, and the like." Dated 24th March, 1891.

5,282.—Andrew Ainslie Common, London, "A new or improved method and apparatus for measuring small intervals of time." Dated 25th March, 1891.

5,296.—George Davies, Birmingham, "Making labels for watches and other articles." Dated 25th March, 1891.

5,402.—Mary McCarthy, London, "Improvements in brooches and like articles for attachment to dress." Dated 26th March, 1891.

5,428.—John Rotherham, London, "Improvements in and relating to secret springs for watch-cases." Dated 26th March, 1891.

5,613.—Frederick Brooks, Birmingham, "An improved fastening or clasp for pouches, wallets, purses, bags, satchels, music-cases, and such like articles; also applicable to other purposes, such as braces, gloves, belts, and other articles of dress." Dated 1st April, 1891.

5,666.—Francis William Engelbach, London, "Improvements in compasses, by which they can be readily and cheaply used as watches or timepieces." Dated 1st April, 1891.

5,670.—Frank Moore and Joseph Henry Cox, Birmingham, "Improvements in the fastenings of solitaires and such like articles." Dated 2nd April, 1891.

5,791.—Thomas Morton and William Pearce, Birmingham, "Improvements in sleeve buttons, solitaires, shirt and collar studs, and the like." Dated 4th April, 1891.

5,865.—Henry Turner Damelow, of the firm of M. Hegmann and Co., Birmingham, "An improved fastening for neck-scarfs, cuffs, coats, and for other purposes." Dated 6th April, 1891.

5,976.—Ellen Edith Cumpston, Liverpool, "Improvements in articles applicable for scarf-pins, buttons, and the like." Dated 7th April, 1891.

6,171.—Frederick Pascall and William Frederick Stocker, London, "Improvements in time-checking apparatus for workpeople, night-watchmen, and the like. Dated 10th April, 1891.

6,213.—Henry Shepherd, Manchester, "Improvements in or applicable to the cases of watches and other similar articles." Dated 11th April, 1891.

6,297.—Alfred Culley, London, "A silver and nickel-plating and polishing paste." Dated 13th April, 1891.

6,344.—C. and W. F. Jennens, Birmingham, "Improvements in links for securing sleeves, cuffs, and for other like purposes." Dated 14th April.

6,382.—Walter Edward Woodbury, London, "A new or Improved phonograph clock." Dated 14th April, 1891.

6,584.—Frank Rothwell, London, "Improvements in alarm clocks" (complete specification). Dated 16th April.

6,602.—William de Courcy Prideaux and James Chadwell Chave, Bristol, "A new method of fastening solitaires, studs, buttons, or similar fasteners for garments" (complete specification). Dated 17th April, 1891.

Gazette.

Dissolutions of Partnership.

Adkins, Henry and Sons, 4, Thavies'-inn, Holborn-circus, London, and 12, Wenman-row, St. Mary's-square, Birmingham, electro-plate manufacturers. March 31. As regards Thomas Joseph Adkins.

Inglis and Wheen, 60, West-street, Sheffield, silversmiths and manufacturers of electro-plate mounted oak goods. March 31. Debts by Herbert Ainsworth Inglis.

Parker and Halford, 69, St. Martin's-lane, dealers in bullion, jewellery, diamonds, precious stones, and plate. April 1.

Bills of Sale.

Anderson, Henry James (trading as H. Anderson and Sons), Broughton-cottage, Alma-grove, Copenhagen-street, N., manufacturing optician. In favour of Frederick Newton and another. Filed April 11. £108 5s. 6d. of plant, machinery, &c.

Barrett, John, 125, Clapham-park-road, Clapham, millwright and engineer, also trading as J. Barrett and Son, same address, watchmakers and jewellers. In favour of Thomas Fairhead. Filed April 13. £52.

Kreutz, Jacob, 97, Goswell-road, Clerkenwell, watchmaker. In favour of Thomas Fairhead. Filed April 6. £30.

Neuhaus, Julius, 20, Market-place Oxford-circus, dealer in jewellery and clocks, and letter of apartments. In favour of Consolidated Company, Limited. Filed April 9. £30.

Pond, William Samuel, 12, Owen's-row, Goswell-road, Clerkenwell, quarter chime regulator and turret clock manufacturer. In favour of Consolidated Company, Limited. Filed April 2. £55.

Reimers, Henry Frank (by his attorney), 98, Chetwynd-road, Dartmouth-park-hill, but now temporarily residing at Kimberley, South Africa, watchmaker. In favour of London and Westminster Loan Company. Filed April 10. £30.

Rodger, David, 16, Granard-road, Wandsworth-common, and at 4, Golden-square, manufacturing jeweller. In favour of Charing Cross Bank. Filed April 19. £65 of property at Granard-road, aforesaid.

Rosenthal, Julius Loewe, then of 4, now 21, Southampton-street, Fitzroy-square, silversmith and jeweller. In favour of Solomon Benjamin. Filed May 24. Settlement in trust for wife, re-registered April 13, 1886, and April 8, 1891.

Willmott, Frederick George, 15, Strutton-ground, Westminster, watch and clock maker. In favour of London and Westminster Loan Company. Filed March 20. £30.

Young, Herbert, 23, Parliament-street, and 2 and 4, Chapel-street, Harrogate, jeweller and general dealer. In favour of Alfred Sellers. Filed March 20. £160 absolute sale of stock-in-trade, &c.

Bankruptcy Proceedings.

Charles, Frederick Harry, 19, Church-street, Soho, manufacfacturing jeweller. Adjudication, March 17.

Friedlander, Jacob, 105 and 7, Hatton-garden, diamond broker and merchant. Adjudication, April 16.

Halstead, James, late 134, Gray-street, now 15, Abel-street, and the Market-hall, all Burnley, jeweller and fancy goods dealer. Receiving order and adjudication, April 9.

Halstead, James, late 154, Gray-street, now 15, Abel-street, and Market-hall, all Burnley, jeweller and fancy goods dealer. First meeting, Exchange Hotel, Nicholas-street, Burnley, May 14 at 1. Examination, Court-house, Burnley, May 14 at 11.

Harris, Charles Stuart, trading as Charles Stuart, 21, Great Sutton-street, Clerkenwell, and Poplar-villa, Chase-side, Southgate, manufacturing silversmith. Examination, 34, Lincoln's-inn-fields, May 7 at 11.30. Adjudication, April 13.

Harris, Charles Stuart, trading as Charles Stuart, 21, Great Sutton-street, Clerkenwell, and Poplar-villa, Chase-side, Southgate, manufacturing silversmith. Receiving order, April 2.

Deeds of Arrangement.

Rodger, David, 4, Golden-square, S.W., and 16, Granard-road, Wandsworth-common, manufacturing jeweller. Trustees: Daniel Wellby, Garrick-street, W., gentleman, and another. Composition of 5s. in the £, payable by two equal instalments at three and six months, from January 4, 1891, secured by assignment to trustees. Filed April 17; liabilities, £1,168 10s.; assets, £175—*Creditors:*—

		£	s.	d.
Wellby, D. and J.	London	308	9	6
Whitehorn, E.	,,	163	16	3
Lord and Dnneanx	,,	92	7	2
Harrison, Bros. and Co.	,,	36	18	2
Crook, Edwin	,,	24	1	2
Bracebridge, —	,,	21	17	6
Ayres, T. R.	,,	19	5	0
Hngueonion, Hall and Co.	,,	14	15	6
Norman, —	,,	13	17	6
Betteridge, —	,,	12	12	0
Kilpatrick, —	,,	14	4	0
Ayres, —	,,	100	0	0

Rosenberg, E. and Co. (Esther Rosenberg, trading as), 162, St. Paul's-road, Canonbury, wholesale jeweller. Trustees: Lawrence Hasluck, 17, Holborn-viaduct., E.C., C.A. Filed April 1; secured creditors, £395 4s.; liabilities, £1,401 11s. 6d.; assets, £247 11s. 6d.—*Creditors:*—

		£	s.	d.
Graham and Co.	London	40	0	3
Barker Bros.	Birmingham	29	13	6
Cox Bros.	,,	390	19	1
Durban and Co.	,,	16	16	3
Field, W. and F.	,,	17	9	0
Griffiths, A. G.	,,	55	2	4
Hezleward, J., and Son	,,	11	7	10
Jackson Bros.	,,	28	8	0
Loach Bros.	,,	77	0	0
Male and Jones	,,	77	6	11
Neale, W.	,,	37	16	10
Nock and Sanders	,,	27	16	6
Oliver, W.	,,	21	9	0
Payton, F. W.	,,	83	11	6
Perks and Marks	,,	13	10	6
Revell, A. C. and Co.	,,	13	2	6
Stainton Bros.	,,	16	6	0
Swann and Adams	,,	68	10	0
Villiers and Jackson	,,	18	2	0
Wall, T.	,,	24	10	7
Wakefield Bros.	,,	50	1	0
Ward and Co.	,,	17	17	6
Whitehouse, E.	,,	94	15	2
Whitely, William	,,	43	1	3
Rosenberg, J.	Cork	39	13	0
Denzler, L. M.	Neuveville	34	4	8

Sheppard, William John Jesse, 320 and 320a, Essex-road, Islington, watchmaker, jeweller, and fancy goods dealer. Trustees: Thomas Pickford, 178, Upper-street, Islington, jeweller, and another. Filed April 1; liabilities, £1,077 3s 8d.; assets, £300—*Creditors:*—

		£	s.	d.
Roberts, Mrs.	London	261	5	0
Grimstead, —	,,	66	16	9
Colls, —	,,	65	8	0
Blanckensee, —	,,	58	14	4
Clifford, —	,,	31	1	1
Cooper, —	,,	25	17	9
Lewis, —	,,	25	0	0
Abrahams, Hyman A.	,,	24	12	4
Abrahams and Sons	,,	21	3	0
Meyers, —	,,	13	12	9
Nordmans, Jules	,,	12	6	9
Tidmarsh and Browne	,,	12	7	8
Clark, —	,,	20	0	0
Walker and Hall	,,	11	6	0
Barker, —	,,	12	0	0
Arnall, —	,,	45	0	0
Blanckensee, M.	Birmingham	262	3	0

Mercer, James A., jeweller, Coleraine. Liabilities, £412 10s. 6d.; assets, £138 11s. The debtor is offering 6s. 8d. in the £, at 4, 8, and 12 months, payable by promissory notes.—*Creditors:*—

		£	s.	d.
Stauffer, Sons, and Co.	London	60	19	6
Cohen, I., and Sons	Birmingham	314	1	9
Silverston, Isaac, and Co.	,,	11	7	3
Taylor, I. and H.	Birmingham	17	13	11
Lyde, W. H.	,,	12	16	6
Crazier and Mitchell	,,	16	6	6
Steel and Sons, Limited	Belfast	17	9	9
Yeomans, Samuel	Coventry	37	4	0
Crossan, M., and Son	Glasgow	15	11	3
Thomson and Williams	,,	19	5	10

Glover, Thomas Samuel, Lion-arcade, Huddersfield, watchmaker. Trustees: Thomas H. B. Tate, Huddersfield, accountant. Filed April 15; liabilities, £487 11s. 7d.; assets, £60.—*Creditors:*—

		£	s.	d.
Brooke, Thomas	Armitage Bridge	343	6	0
Dewhurst, Henry (Trustees of)	Huddersfield	69	12	8
Foster, J. and L.	Manchester	15	8	7

Notices to Creditors.

Fileman, Henry, 49 and 51, Hornsey-road; 9, Priory-terrace, Acton; 51, High-street, Kingsland; 33, Church-street, Camberwell; 45, High-street, Northfleet; and 159, Queen's-road, Peckham, pawnbroker, jeweller, and general salesman. Discharge refused: February 11.

Levy, Maurice, 32, Great Clowes-street, Lower Broughton, Manchester, wholesale jeweller and importer of foreign fancy goods, trading with Samuel Hyam Weingold, as Weingold and Levy. Discharge granted: February 25, subject to eighteen months' suspension.

Thomas, Sidney, 41, Godolphin-road, Shepherd's-bush, and 47, Albemarle-street, Piccadilly, jeweller. Supplementary dividend of 5¾d. at Official Receiver's, 33, Carey-street, W.C., any day (except Saturday) between 11 and 2.

A Diamond Merchant's Affairs.

His Honour Judge Horatio Lloyd heard an application in the Bangor Bankruptcy Court for the discharge of Robert Slateum, residing at Rhyl, formerly of South Africa. An application was also made for a transfer of the proceedings to Chester. The debtor's liabilities amounted to £205 19s. 6d., and were made up of two debts. A few years ago the debtor returned from South Africa with diamonds of the value of £36,000. He set up business in London, Liverpool and Rhyl, and became insolvent. The proceedings were adjourned.

Re J. H. Blackburn, Jeweller, etc., 1, Church-street, Colne.

At the meeting of creditors held in the matter of J. H. Blackburn, at the office of the Wholesale Trades Association, Birmingham, on the 24th ult., Messrs. Poppleton and Appleby, chartered accountants, submitted a statement of affairs, which showed liabilities amounting to £743 3s. and assets £290 15s. 5d. The debtor commenced business in a small way as a tobacconist, working jeweller, and newspaper vendor in the neighbourhood of Colne about four years ago. In August, 1888, he removed to his present premises. The debtor could not make any offer, as his takings since he has been in business have not averaged £10 per week. After some discussion it was decided that the estate should be wound up under a deed of assignment, which has been executed to Mr. G. Graham Poppleton as trustee. A committee of inspection, consisting of Mr. Wm. Griffith (Messrs. W. Griffith and Sons, Birmingham, £140), Mr. W. J. Ginder (Messrs. Ginder Bros., Birmingham, £23), and Mr. W. H. Floyd (Messrs. Constantine and Floyd, Birmingham, £46), was appointed to assist the trustee in realising, with power to vote his remuneration.

Review.

Bibliotheca Polytechnica: A Dictionary of Technical Literature. London: Sampson Low, Marston and Co.

M. F. von Szczepanski has issued the first annual volume of the "Bibliotheca Polytechnica," which proves to be an admirable classified catalogue of all books and journals published in England, America, France, and Germany, their relation to legislation, hygiene, and daily life being clearly indicated. The catch-words are given in English, French, and German, and the work should be of immense value to students of contemporary literature in each of these countries.

ANSWERS TO CORRESPONDENTS.

F. Lomas.—The platyscopic lens, is a combination of lenses so arranged as to give—as its name implies—a flat field. All who are in the habit of using high-power lenses are aware that the field is always a segment of a large globe. It is usually assumed that rays emitted from a single point intersect also after refraction in a single point, but this is not so when the aperture exceeds 10deg. or 12deg., in which case the rays which traverse the lens near the edge are refracted to a point nearer the lens than those rays which pass nearer to the axis; hence the impossibility of a sharply defined field. Until the time of the "platyscopic," diaphragms were used, so as to only employ the rays which passed through the centre of the lens; but with the new combination a perfectly flat field is obtainable, and the magnifying power can be increased very high in consequence. They are made by Mr. Browning, optician, Strand, London, W.C., in various strengths, at £1 1s. each. The one we use is $\frac{1}{4}$ inch. It necessitates bringing the eye rather close, to obviate which we frequently employ it as an objective, and an ordinary watchmaker's achromatic eye-glass as an eyepiece; it thus forms quite a powerful microscope. We hope in time to describe all instruments up to date and their uses.

Gravity.—There are several reasons why a pound weight, weighed against gravity in different parts of the globe or at different elevations, should not be the same; or that a pendulum of given length should not vibrate in the same time. For it follows that as the gravitating attraction of bodies varies inversely as the square of their distances, the elevation of an object removes it farther from the centre of the earth, and hence their attraction becomes lessened, the pound becoming lighter. Moreover, the earth being a slightly oblate sphere, *i.e.*, flattened at the poles, near those positions an object is closer to the centre of the earth than when on the equator. Such differences, however, can only be detected by good spring balances. With the pendulum it becomes more obvious, and when transferred to the equator the effects of the rotation of the globe, which are *nil* at the poles, gives rise to a centrifugal force acting in opposition to gravity; and by experiment we find that for a pendulum beating seconds at Greenwich, it would be necessary to shorten it 3mm. if transferred to the equator, and lengthen it 2mm. if transferred to the poles, for it to continue to beat seconds.

J. S., Leeds.—About two years ago Mr. A. S. Murray revised the catalogue of the engraved gems in the British Museum. It now contains a description of 2,349 specimens of ancient glyptic art, and is illustrated by about 200 *facsimiles* charmingly executed. There is also a fine bibliography and index of descriptions added; also index of subjects. There is a well-written introduction, condensing all that is known upon the subject to about 40 pages. There is no better book than this that we can recommend you. It is additionally valuable from the fact that each of the specimens are the property of the nation, and can be viewed whenever we like to take the trouble to pay a visit to the British Museum.

P. S., Liverpool.—The gems in Ceylon are found in what we should in this country call a gravel, called by the Cingalese *Elam*. Pits are usually sunk a few feet into this material, but sometimes they are carried on a scale which would be equivalent to mining; indeed, the workings are distinguished as pits and mines. They are also found in the alluvium of rivers, the finder generally being the cutter. Usually such stones are very irregularly cut, being cut for weight only; but there are also in Ceylon some very skilful cutters who can teach English lapidaries how to make the best use of the smallest amount of colour. Their best customers are the tourists who call at Colombo. Each ship is surrounded by innumerable natives, who force upon travellers their gems, always offering to let them take them to England and get them valued, and send them back about half of what they find to be their European or American value. With this method it is astonishing the amount of confidence they inspire in the passengers, so that for every one that takes them to be valued, nine pay for them. We need not remark that, were the figures reversed, and only one in ten paid for them, they would still make a handsome profit upon their market value; for although we must blush to say so, metal mounts and pastes are exported into Ceylon from the civilised west to assist these unprincipled rascals in their nefarious habits.

J. Allday.—We have heard of the new aluminum alloy of which you speak. It is made at Wolverhampton, and if all is true we have heard, it will no doubt be used for all purposes where tenacity is the great object. In the process, the flux, when brought into a fusing state in the presence of iron, gives off aluminic vapours, which have a strong affinity for the iron, forming a natural alloy.

R. Turner.—We cannot recommend you a better escape wheel cutter than Mr. Curzon, 3, Spencer-street, E.C.

VOLUNTARY HALL-MARKING.

To the Editor of The Watchmaker, Jeweller and Silversmith.

Sir,—Many of your readers seem to be under the impression that "the abolition of *compulsory* hall-marking means the entire abolition of the whole hall-marking system." This is quite a wrong impression; the hall-mark is so very popular in Great Britain and most of the Colonies, that no one cares to buy any goods unless they have the mark on. Perhaps your readers do not all know that hall-marking is now as nearly voluntary as it can be, and I am firmly of opinion that if hall-marking was done away with it would be a most disastrous calamity to our trade; and I hope there is no one who would for one moment wish such a serious alteration. Our only desire for "*voluntary hall-marking*" is to enable us to make silver goods, such as tea sets, waiters, etc., for our foreign trade of different qualities and with special marks on (not hall-marks) to suit the particular requirements of certain countries. I cannot see that voluntary hall-marking would affect the home trade at all.—Yours faithfully,

A. Sydenham,
Wholesale Manufacturing Jeweller,
26, Frederick-street, Birmingham.

THE PLATE LICENCE.

To the Editor of The Watchmaker, Jeweller and Silversmith.

Sir,—*Re* the letter of Mr. J. Simpson Yeates in your issue of April 1, I tender the following observations. I would have plate licences to comprise all small weights from a half grain. As the law now stands, to obtain convictions for infringements it must be shown that a profit is made by the trading. People perjure themselves, not admitting profits are made, and therefore prosecutions cannot be sustained. It might be well not to allow people to trade unless they have a practical knowledge of the qualities, methods of testing, etc., of gold and silver.—Yours sincerely.

Henry Steer.

During the early part of March the death took place of Mr. James Broyden Banks, watchmaker and jeweller, of High-street, Runcorn.

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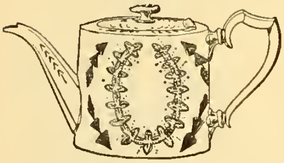

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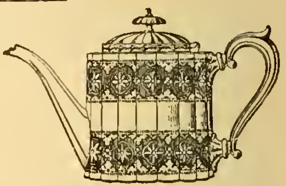

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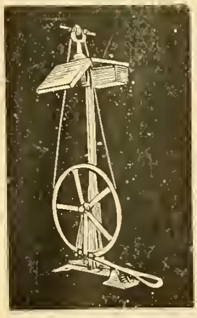

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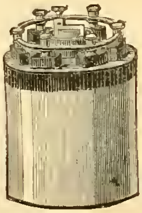

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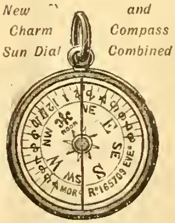

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The Watchmaker, Jeweller and Silversmith.

Edited by W. J. LEWIS ABBOTT, F.G.S.

Entered at Stationers' Hall.] [*Registered for Transmission Abroad.*

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Worse than Forgery.

> "Who steals my purse steals trash . . .
> But he that filches from me my good name,
> Robs me of that which not enriches him
> And makes me poor indeed."—SHAKESPEARE.

MANY and great were the evils which the Merchandise Marks Act sought to remedy—greater perhaps than any one but those who took an active interest in its introduction had the slightest idea. Especially was this the case in Sheffield, where, we regret to say it, rubbishing goods made in Germany were marked and palmed off as British manufacture; thereby not only obtaining a higher price for the vile stuff than could otherwise be obtained, but also palming an inferior article upon the public, to the resulting discredit of Sheffield ware. But a short time ago we were informed by Mr. W. F. Wardley, at a dinner in connection with the South Yorkshire Enginemen's Protection Association, that practices have come to light which, by their villainy, make the former quite moral.

He asserted—and we have no reason to doubt his word, especially when we remember how prominent a part he took in the agitation of the Merchandise Marks Act—that he recently saw some good honest Sheffield cutlery which a Sheffield manufacturer was turning out for a German customer, but on which (despite the Merchandise Marks Acts) he was stamping the German's name. This was illegal and bad enough, both objectively and subjectively; but it is not all. The articles were actually being sent by the German into neutral markets, along with rubbish made at Solingen or Remscheid, but upon which was stamped the name of a Sheffield firm! Imagine, for a moment, the effect of these marks upon the minds of the people. Naturally they would consider the German goods superior to the Sheffield article. "Sheffield make" would henceforth to them be a synonym for rubbish. It is difficult to realise the heartlessness of men who would be guilty of such nefarious practices, and was it not for the fact that the Sheffielder is a party to the dishonest and dishonourable business, we should feel it a question in which the German Government ought to be asked to interfere; but as it is, the former is the more rascally of the two, and in our opinion such true-born Britons should be relegated to a place where their love of country would not be likely to be wasted in the operations of their daily life. Meanwhile we cannot help the phantom-like forms of men arising before us, who have perished in wars which had their origin in crimes of far less magnitude than these, or thinking that this is really a case in which the Governments of both countries ought to interfere for the maintenance of the twin principles of common right and fairness.

The Merchandise Marks Act and the Action of the Trade.

AT the special meeting of the trade, under the auspices of the Watch Trade Section of the London Chamber of Commerce, on the 15th ult., as we anticipated in our last issue, those representative members who had studied the Act most fully, and who had heard the various expressions of opinions of their brethren, came to the conclusion that the most advisable course to take was to give expression of assent to the conclusions arrived at by the sub-committee, which we have already published. It is obviously necessary that some sort of uniformity of action should exist amongst the trade, and also that each member should be able to know if he is acting legally or illegally. Not that a decision of a meeting of the trade constitutes the law of the land, but in a multitude of counsellors there is probably more wisdom than in any single opinion, and a compliance with a resolution so passed would exonerate the individual from acting with a guilty knowledge, and go a long way to establish his innocence; or, to use the words of the esteemed chairman, the objects of the meeting were to "strengthen the weak, to frighten the unscrupulous, and to encourage those who were dealing fairly." We can only say that we wish a body composed of all sections, and as truly representative of the trade as was this, would band together to secure such laudable and necessary objects; for the day in the history of the great peoples of the earth is past when each can operate in his own particular way, totally regardless of the complications of modern civilisation with which he is surrounded.

Horological Notes.

ORIGINAL AND "CLIPPED."

The Watch Trade in New Zealand. NEW ZEALAND proposes to develop watch manufacture. A Coventry man in the trade received last month an order for 200 sets of interchangeable movements, to be sent out to Gore, in order to be made up into watches. There must be skilled labour in New Zealand for this work, and no reason why watches should not be put together there, though if all the movements have to be imported it is doubtful if there will be much saving to the purchaser of the complete article.

* * *

The Eyes of Watchmakers. SOME months ago we asked our readers to be kind enough to supply us with the particulars of the "sight" of all watchmakers they knew, *i.e.*, whether they were affected in any way or not, to assist in determining whether the use of the eye-glass is detrimental to the vision. We expressed our opinion then that we did not think the eyes of watchmakers were affected so much as might be imagined. Several doctors on the Continent have lately taken up this line of observation, and are collecting statistics which fully bear out our own view of the matter. We should, however, be very glad to receive these particulars from our own *coterie*—the readers of this journal.

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Watches and Steam Hammers. NOT long ago the young Emperor William of Prussia made a state visit to the great establishment of Herr Krupp. In one part of the factory was a costly steam hammer, weighing fifty tons, and on that occasion it received its royal name, "Unser Fritz." The machinist who has charge of this hammer is a very skilful and hard-working man, and one of whom the famous gun maker is quite proud. So Herr Krupp presented to the Emperor this ingenious and faithful workman, with the remark: "This is Fritz and his big machine; and he handles it so truly that he can bring down the hammer with all its might and stop it at a tenth part of an inch above the anvil." Without a word, the Kaiser took out his diamond-studded watch and immediately placed it in the centre of the anvil, smilingly ordering Fritz to let fall the hammer and arrest it before it could touch the watch. Some of the King's suite, who stood by, looked amazed, and the faces of others showed much doubt. The operator hesitated; but Herr Krupp urged him to make the trial, and at last, at the command of his master, Fritz "let fly!" Down came the immense tool with all its force, and was checked, as if it had been a feather, so close to the watch that a baby's hand could not have been inserted between it and the dial. "Well done!" cried the delighted monarch. The nearest of his courtiers all drew a long breath, and Herr Krupp looked greatly pleased. Then the master stooped down to lift the watch from its hard bed, but the Emperor stayed his hand, saying:—"The watch belongs to Fritz; he has earned it." Herr Krupp took out his purse, added to the King's gift a thousand marks in gold, and handed all to the blushing Fritz.

When the Shah of Persia was in this country and visiting Woolwich Arsenal, he witnessed an altogether more astounding feat than the foregoing, for upon laying his watch beneath the ponderous crusher, the engineer brought down the hammer *upon* it just sufficient to crack the glass and not otherwise to damage the watch. Needless to say, the Shah did not give his gold repeater to the workman. We think Fritz ought to go halves with the inventor of that hammer.

Watch-making in France. THE Besançon Chamber of Commerce has forwarded an advance statement of the operations of the French watch industry to the London Chamber of Commerce, which shows that the anticipations formed in 1889 of an improving course of business were fully realised in 1890. Out of 404,436 watches of French manufacture "delivered for consumption" in 1890 (113,394 being gold and 291,042 silver), no less than 401,439 were passed by the Besançon Control Office, of which 110,581 were gold and 290,858 silver. Foreign watches to the number of 40,911 were passed as follows: at Pontarlier, 22,557; Montbeliard, 10,986; Bellegarde, 3,859; Paris, 2,031; Besançon, 902; and all other offices, 576. Of the total foreign watches, 8,515 were gold and 32,396 silver. As 2,650 out of the 2,743 gold watches passed by the Paris Control Office were of Besançon origin, it follows that no less than 404,089 out of 404,436 watches, partly consisting of precious metals manufactured in France last year, stand to the credit of Besançon. Comparing the French watches with the foreign articles, Besançon supplied 90·70 per cent. of the "general consumption," against 89·51 per cent. in 1889, and 85·45 per cent. in 1888. Whilst the number of watches delivered for interior consumption increased in 1890 by 579 for gold and 19,018 silver articles, the imports from abroad decreased in respect of gold by 2,303, and of silver by 1,229.

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A Novel Calendar. THERE has been exhibiting for some time in Paris an interesting piece of mechanism in the form of an eight-day clock, which chimes the quarters, plays sixteen tunes, playing three chimes every hour, or at any interval required by simply touching a spring. The hands go as follows:—One once a minute, one once an hour, one once a week, one once a month, and one once a year. It shows the moon's age, rising and setting of the sun, the time of high and low tide, besides showing half-ebb and half-flood. A curious device represents the water, showing ships at high-water tide as if they were in motion, and, as it recedes, leaves them high and dry on the sands. The clock shows the hour of the day, the day of the week, the day of the month and the month of the year. The mechanism is so arranged as to make its own provisions for long and short months. It also shows the signs of the zodiac, and the difference between sun and railroad time for every day in the year.

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Synchronising Clocks by Telephone. MR. A. G. BURRELL, of Sheffield, has successfully worked out a new method whereby he is enabled to convey the synchronising current for clocks through existing "telephone" wire. Greenwich mean-time is thus automatically transmitted from an astronomical regulator Telephone Exchange, and from thence the time current passes instantaneously through the telephone wires to the synchronising instruments attached to the clocks. One of the most notable features of this invention is that the interruption of the telephone circuits is only of momentary duration, and therefore is scarcely noticeable during a conversation on the same wire. On the other hand, the passage of telephone ringing or other currents does not in any way affect any of the instruments employed in this entirely new system of synchronising.

German Clocks. We hear that several cases of German clocks have lately been seized, although bearing the words "made in Germany," on the back, when the name of English firms appeared on the dials. This, of course, might have arisen from the ignorance of the law by the German makers, but at the same time it is no more than anyone would expect, that the authorities would not be satisfied with such marking. The "place of origin" must be as legible as the "maker's" name. While speaking of these clocks we may mention that we have long felt that our own manufacturers might take a lesson from them — they are marvels! There are hundreds of customers who would give a ten pound note for a chiming clock of good appearance; but when they are asked the price of anything that any British manufacturer produces they are frightened; we are fully aware they are altogether different in quality from our own manufacture, but they keep time, look well, and cost little, and we are sure that something on their lines would find a ready sale here.

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Ben Franklin's Watch. One of the curiosities as well as old relics that attracted more than the usual attention at the Baker sale of relics held at Thomas Birch and Sons', on Chestnut-street, Philadelphia, recently, was "Poor Richard's" watch, once the property of Ben Franklin. When this quaint old timepiece was reached, which has a longer pedigree than the black fob attached to it, there were various witticisms passed upon it. Mr. Henkels, the auctioneer, asked for a bid, and was asked by a gentleman, who was evidently in search of a guide to its value, how much it weighed in silver. No bids were forthcoming. Everybody appeared afraid to start it, so Mr. Henkels took the initiative. "Two-hundred-and-fifty dollars," he said, and then in emphasis: "That's what it weighs in silver." He had hardly the words spoken when the bids began to mount skyward. At first 50dols. steps were taken, then 100dols. Soon some one had bid 900dols. Then in rapid, feverish spurts, the two gentlemen who fought with 100dols. bills for the possession of the bull's-eye timepiece, which, by the way, is without a crystal, had it all to themselves. Their competitors had given up the chase, and a Mr. Murphy, who, under the alias of "Bradford," was bidding for Senator Hearst's family, found he had a persistent rival in the person of the mysterious "Mr. Buckley." The two fought it out rapidly and good-naturedly until it was held at 2,000dols. Then "Mr. Buckley" went 100dols. better, the auctioneer's hammer was held anxiously in the air for a moment, then, as no more bids were heard, it descended, and "Mr. Buckley" was declared the winner for 2,100dols. Who "Mr. Buckley" is no one seemed to know.—*American Jeweller, Watchmaker and Silversmith.*

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Alvin Lawrence, horologist, of Lowell, Mass., writes us that his patent pendulum, which admits of perfect adjustment to temperature, is rapidly replacing mercurial pendulums in the observatories throughout the States. He was awarded the silver medal and diploma, the highest award in the class, at the Massachusetts Exhibition of 1890. One of these regulators, purchased by Mr. E. C. Blaisdel, of Lowell, has recently made a run of fifty-nine days with a total variation of one second. This is surely a record in horology.

Messrs. John Wilkins and Co. are a firm who manage to keep in Clerkenwell a good deal of work which at one time had to be sent to Paris. They have deservedly won a great reputation for excellence in gilding, plating, lacquering, and bronzing, and rival Parisian artists in superb colour and finish, and in fine and delicate work such as matt-gilding. A speciality of the firm is a cheap bright gilding on zinc cases, which will stand the weather without tarnishing.

Sheffield Notes.

(By our own Correspondent.)*

Business during the past two months has been carried on, or rather not carried on, under the most remarkable conditions. Orders may have been pressing or otherwise, but "La Grippe" has been master of the situation. The proportion of active workers placed *hors de combat* within the space of a few weeks is unprecedented in the case of any epidemic by which the town has been visited. The small-pox plague ruined our trade while it lasted, but this was done more by frightening away customers than by any crippling of our producing powers. In the case of the recent influenza visitation, however, the working power of many factories has been reduced by two-thirds, which practically meant the stoppage of work for the time being. The phenomonal death-rate, alarming as it appears when expressed in figures, is not so important from an economic point of view. A glance each morning down the long roll of victims shows that it is mainly made up of those who in the ordinary course of nature would soon have passed over to the majority in any case.

Among these we regret to have to record the case of Mr. Michael Beal, jeweller, of Market-place, whose death occurred on the 6th of May, at the ripe age of 81. Mr. Beal commenced business in 1848 with the by no means excessive capital of £100. From this humble beginning has developed one of the leading jewellery businesses of the town. For about thirty years Mr. Beal took a prominent part in the business of the town, and with his death has passed away the last of the old school of Sheffield public men. A pathetic interest is lent to his death by the fact that Mrs. Beal died only a few days before her husband. They leave behind them a grown-up family of two sons and four daughters, and it is not probable that the old-established business will be affected in any way by the sad event.

The remarks I made in April as to the desirability of compelling manufacturers to indicate by some mark the difference between ivory and its substitutes have been emphasised by a case just decided at the Blackpool Police Court. It is much to be deplored that the flights of oratory indulged in by cheap auctioneers should be curtailed, but since the passing of the Merchandise Marks Act it is found that, even in the auction room, truth is mighty and must prevail. This, at any rate, must be the sad reflection of Mr. David Fish, of Blackpool, who has been mulcted to the tune of £4 12s. 8d., for selling half a dozen knives with handles which he stated to be ivory, but which were ultimately proved to be xylonite. The prosecution was undertaken at the instance of the Sheffield Federated Trades Council, a body on whom seems to devolve the task of seeing the Act enforced all over the country. It is just possible, however, that here and there sales may be effected which the eagle eye of the Sheffield working man fails to detect. Although, therefore, the purchaser of cheap lots may not be deserving of much sympathy, yet the interests of honest trading seem to demand that a distinguishing mark should be struck on xylonite and ivory handles. This is all the more necessary because even professed experts often fail to detect the difference from the appearance alone.

Speaking of handles reminds me of a curious controversy which is now being carried on through the medium of the local press. The disputants have adopted the singularly appropriate *noms de plume* of Gravedigger No. 1 and Gravedigger No. 2, and the point in dispute is as to the advisability of marking the bone handles of the cheaper sort of cutlery with their "source of origin." This appears on the face of it the *reductio ad absurdum*, as, granting the fact that the British empire cannot supply Sheffield with sufficient bone to haft its cutlery, and that large quantities have to be imported from America, it would scarcely enter into the mind of the average purchaser that he had been cheated if he ultimately discovered that he had bought a lot of knives and forks hafted with American bone.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

I SAY "average purchaser" advisedly, because there are well-authenticated instances of people who are very particular indeed as to the sort of bone they will have upon their cutlery. Not many months ago a gruesome individual took it into his head that he would have the handles of a pair of carvers made out of a pair of human thigh bones. After a great deal of trouble on the part of my informant, the head of a firm in the bone trade, his wish was gratified. This is, perhaps, where the gravedigger part of the business comes in, but if all tales be true, it would not always be necessary to interfere with a churchyard in order to execute an order of this sort. A Sheffield bone-cutter not long ago bought a ship load of bones at Liverpool, of which he had more than his suspicions. The bulk of the cargo was ground up into dust, but it is not absolutely certain that the choicer lots were not ultimately made into handles.

THE 10 per cent. dividend just declared by John Round and Son, Limited, may seem only a moderate return when compared with the 25 per cent. declared by some of the large steel companies. I very much doubt, however, whether any of the shareholders in the silver company would exchange their stock for certificates in any of the steel companies. 25 per cent. in the steel trade only comes when the tide of trade is at the flood, whereas for years the business of John Round and Son has showed the same satisfactory results. It reflects infinite credit on the management that this should be so, and that their success is well deserved may be ascertained by anyone who takes the trouble to walk round the show-room of this enterprising firm.

THE annual meeting of the Metal Trades Pension Society has been held in the Cutlers' Hall, and the result shows that the appeal made last year for increased subscriptions has not been made in vain. In the list of successful applicants for the pension this year I am glad to find the name of the widow of Mr. J. A. Rhodes, a man who will certainly deserve mention when an exhaustive history of the Sheffield silver trade comes to be written. Mr. Rhodes was a saw piercer of great ability, and trained in his workshop several apprentices, some of whom ultimately excelled him in executive skill. Saw piercing, as every silversmith knows, is an art which must be exceedingly well done or it is more than wasted. Mr. Rhodes therefore had no difficulty in securing the patronage of all the leading firms in the town. It ultimately occurred to him that the process could be applied to articles which were solid throughout, such as teapots, claret jugs, and the like. His first essay in this direction was a jewelled casket, which he sent to the Workmen's Exhibition, and which was successful in carrying off the only gold medal awarded. The body of the casket was solid silver, and this was covered with an elaborate design in fretwork, soldered on to the body and afterwards gilt. The general effect was rich in the extreme. His success encouraged Mr. Rhodes to patent the process, and he forthwith commenced to manufacture on his own account. The process, however, was an expensive one, and the time was one of great commercial depression, when only the cheapest class of goods had any chance of being sold, and his venture, consequently, was not a commercial success. During the short period in which Mr. Rhodes carried on business, he produced articles of the highest artistic excellence, and there must be in the possession of rich people throughout the country tea sets and other things which will some day be worth very much more than their intrinsic value.

IT is only repeating a truism to say that exhibitions are played out. We have just had one in Sheffield which, although like all recent affairs of the sort, only an advertising medium, has resulted in a financial success to its promoters. The show was held in the Drill Hall, which, besides being a most appropriate building in point of size, was transformed into a really attractive evening resort. The silversmiths of the town, to whom a local advertisement is of no account, were conspicuous by their absence; but the Sheffield Goldsmiths' Company, as a retail jewellery concern, found it worth their while to make a most attractive display. Their exhibits occupied two stalls, where a fine assortment of precious stones and jewellery was set out. Perhaps the most interesting from a popular point of view was their large military automaton clock with its castle, bugler, and squads of troops. These latter set in motion every quarter of an hour and marching up inclines and through gateways, finally disappearing in the interior of the castle, were watched by admiring crowds of sightseers. This enterprising firm, with their electric light and well set-out windows, are very much *en evidence* in the centre of the town, and are by no means deficient in that *sine qua non* of modern trading energy.

Goldmaking Swindles.

OWING to Mr. Streeter's popularity it was only natural that the enterprising would-be alchemist should aim at him. The details of this case, so far as it has gone, having been published in almost every paper throughout the country, we need not again detail it here, suffice it to say that he pretended he could place any quantity of sovereigns in his apparatus, and by a mixture of some secret concoction, in a number of days they would result in a nugget of gold of the same quality, treble the weight and value. We might, however, notice in passing that it does not appear to have occurred to others that in multiplying the weight of 22-carat gold he would necessarily have had also to bring into existence some alloy, silver or silver and copper. The impossibility of such an operation need not of course be referred to. There are several points, however, which may be new to our readers, and which may prove interesting. There are well-known in America three brothers, the sons of a chemist, who have amongst the nefarious practices by which they have subsisted, duped the more credulous of American and other people by alleged goldmaking tricks. Some of the names which these have passed under are Albert Wise, Jacob Bondheim, Edward Pinter, George Black, and John Wilton, and from information we have received from Chicago, Baltimore, and New York, when coupled with what we know of the facts of this case, which have not yet been brought forward, presenting such a parallel as they do in the *modus operandi*, we cannot help recognising the same hand in each case. It is also said that one of these identified himself with the London Bank sneak mob, composed of Charley King, Billy St. Clair, and other notorious criminals. It is also said that several men of the highest standing in the financial world have been duped by the goldmaking swindle, but are ashamed to have the facts made public. But there is one gentleman in Liverpool who is not so cowardly, and his case will be dealt with at the next hearing. We also heard on the best authority that a man who appeared to answer the description of Pinter had successfully operated in Australia.

Midland Jottings.

(By Our Birmingham Correspondent.)*

DURING the month that has passed many have experienced a great falling off in trade. Doubtless the bad weather is to blame, as on the slightest sign of fine weather, both in town and country, buyers increased, which necessitated a replenishing of stocks. There are, however, numerous orders on hand, but the state of trade generally is unsatisfactory.

WE recently paid a visit to the establishment of Mr. Joseph Spencer, lapidary, 75, Spencer-street, Birmingham, and we were very much struck with the magnitude and diversity of the branches of his business. When we saw the large quantity of machinery, embracing some of the newest kinds for the better performance and perfection of all kinds of work, we could not help wondering how it was that anyone could still send work out of the country to be done, except from the fact that they by some means or other could not be aware of the existence and capabilities of this establishment. We were very much struck by the high class small work, such as rubies and sapphires, and felt how thoroughly they eclipsed the Jura cut stones both in shape and polishing. With the less hard stones we were equally pleased, especially in the carving, drilling, and inlaying of them, and although the latter is not so fashionable as it has been, it is nevertheless very lovely, and people who have them treasure them, and when one is lost they have it replaced; in most cases when this occurs the jeweller with whom the order is placed sends it to France, whereas it could just as well be done here, and with half the delay and trouble, and with no risk. The machinery for heavy work was also interesting, every kind being carried out from small lenses to table tops. If any of our readers have anything they wish to get done well and at a reasonable price, we should recommend them to send to Mr. Spencer, who would be pleased to furnish them with quotations, etc.

UNDER the name of Reading and Lee, at 45a, Frederick-street, Birmingham, are trading as manufacturing jewellers and diamond mounters, Mr. Geo. E. Reading, late with the firm of Messrs. Jno. Reading and Sons, Spencer-street, Birmingham, and Mr. Edmund B. Lee, whose business has been transferred from 2, Warstone-parade East. The partnership of these two gentlemen, so well-known in the trade, and bearing an enviable reputation of many years standing for excellence in the class of work they have individually superintended and satisfactorily produced for the various firms whose custom they have secured, cannot fail with their combined abilities to be a thorough success, and be accorded a full share of the recognition sought for. As manufacturing jewellers and diamond mounters the business extends over a large area, but diamond mounting and high class diamond work generally is made a specialité, upon which special attention and care is bestowed in order to turn out really fine work.

MR. GEORGE E. READING brings with him a very extensive and varied experience, for, in addition to his general knowledge of the trade, he was for the last ten years almost wholly connected with the ring department of the firm he has left. To descant upon the quota of experience and ability contributed by Mr. E. B. Lee is superfluous, bearing in mind his sound commercial habits and the nature of the business presided over so successfully by him at the late address.

MESSRS. DEAKIN AND FRANCIS, of 17, Regent-place, have been remarkably successful in their recently patented "Hook Brooch and Collar Fastener," which is quite an interesting novelty, extremely simple and most effective. It is instantly attached by its two hooks which are connected by a spiral spring drawing them up to each other in a close embrace, and thus holding the material in which they are inserted with a firm grip, no matter how thick it may be. It also acts as a dress adjuster, for it pulls the ends of the collar of the gown together and holds them in place. Its advantages over the old form of brooch are very obvious, for it has no pin to get loose, fall out and spoil one's temper, or scratch one's finger, and this is no small thing in a new brooch!

MESSRS. DANZIGER AND ISAACS, of 41, Frederick-street, are importers of all kinds of jewellery materials in gold, of 7, 9, 13, 15 or 18 carat, and in standard and other qualities of silver. The firm invite the trade to apply to them for quotations for galeries, machine and fluted beads, tasselling, lace, Brazilian and Beatrice chains, as well as hollow and solid P. of W. chain and safety chain, tassels for chains, fancy tube bangles, and all kinds of metal goods for the jewellery trade. Among the specialities for silversmiths may be mentioned various designs of stampings for mirrors, photograph frames, buckles, box-tops, and book mounts. These things the firm keep a large stock of and are always glad to send patterns out for selection if application is made for them.

A NEW catalogue which will be useful to all retail dealers in photographic and optical goods in general has just been issued by Messrs. J. and H. Taylor, of Tenby-street North. The goods illustrated and priced in this list resolve themselves into four classes:—spectacles of all kinds; telescopes and all sorts of binocular glasses; thermometers and barometers, mercurial and aneroid; and photographic apparatus of every description.

MR. W. SUCKLING, of 35, Albion-street, makes a specialité of Prize Cups for Athletic Sports, and he has brought out some fine designs for the coming season, which will not fail to command a ready sale. He also manufactures electro-plated wares of every description. Mr. Suckling deals with wholesale houses only.

NOW that the fruit season will be coming in and pickles more in demand, a good useful fork or server should have a good sale. In Messrs. W. Vale and Sons' "Patent Automatic Fork" such a desideratum will be found. It is inexpensive, elegant and effective, and prices may be obtained from Messrs. Vale, at their works, 83, Unett-street, Birmingham.

MESSRS. WILLIAM GRIFFITH (of W. Griffith and Sons), W. J. Ginder and W. H. Floyd (of Constantine and Floyd), who are the chief creditors of Mr. J. H. Blackburn, of Colne, recently "wound up" by deed of assignment, have been appointed a committee to assist the trustee to realise on the estate. The sum represented by the claims of these three firms is over £200.

ALL repairers of jewellery and watches will do well to send to Mr. Henry Pitt, of No. 1, Warstone-lane, for a price list of scratch-polishing or plate brushes and bobs and mops in wool, felt and buff, which are suitable for every purpose required.

MESSRS. THOMAS HALL AND CO., of Coventry, were the manufacturers of the fine gold watch which was presented the other day to the Rev. Father Sweeney, on the occasion of his formal resignation of the post of chaplain of the Earl of Denbigh.

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* We must not be understood as endorsing all, or necessarily any, of the views of our correspondent, who writes on his own responsibility.

Watch and Clock Making.

(*Continued from page* 235.)

Answers and Notes to Questions set at the City and Guilds of London Institute Examinations.

By I. Hermann,

Director of the Polytechnic School of Watch and Clock Making.

(II.)—Advanced Paper, 1880.

QUESTION (2).—Explain the terms momentum, draw, lifting arc, and the expression G = 32·2, and distinguish clearly between mass and weight.

Answer.—The term momentum denotes the product of the rate of motion and quantity of matter in a body, and is symbolically represented by the algebraic expression

$$M\,V \quad . \; . \; . \; . \quad (a)$$

where V stands for velocity in feet per second, and M for the quantity of matter contained in the moving body, with the pound as unit.

"Draw" is a distinct property of detached escapements. To render the "blocking" of the escape wheel, and "isolation" of the balance during the supplementary arc effective, the face of the detent pallet in the chronometer and locking planes in the lever are set at an inclination to the direction of motion of the escape wheel. This combination constitutes the principle of the movable inclined plane or wedge, and forms a central force in the direction of the escape wheel, the effect of which is termed "draw."

The term lifting-arc denotes "the action of any escapement in reference to the moderator when the latter moves from rest." The resolved part of gravity which acts perpendicular to the pendulum and the moment of the balance spring form central forces, which are zero at the point of rest and increase as the angle of displacement (see (4) in I. and (1) in II.) Hence during impulse the escape-wheel moves against a resistance that increases as the space described, and has its limit when a tooth reaches the edge of the impulse plane. The motion of the pendulum and of the balance, concurrent with this motion of the escape-wheel is termed lifting-arc.

The force that acts on bodies in a direction perpendicular to the surface of the earth is termed gravitation. Its intensity is shown by the velocity increment added in a unit of time when a body falls in vacuum, and is measured by means of the pendulum, by Attwood's machine, or by Galileo's inclined plane.

Gravitation has a variation due to local causes, but mainly by reason of the depression of the earth's surface at the poles, and by revolution towards the equator. By general consent g is accepted as the symbol of the accelerative effect of gravity in a second of time, expressed in the national unit of length. Thus for Great Britain, where the foot is the standard of linear measure, G = 32·2 implies that a body falling freely from rest in vacuum, at the end of one second of time acquires a velocity which, if it remained constant, would cause the body to move over 32·2 feet in every succeeding second. For the latitude of Greenwich, G = 32·19.

Mass denotes the quantity of matter in a body which is measured by means of the attractive force of gravity, since that varies as this quantity in any given latitude. By any arbitrary method a quantity of matter may be selected as a unit for determining, by comparison of their gravitation or weights, the corresponding quantity in any other body. Hence weight indicates the measure of a quantity of matter or mass.

Since the quantity of matter in a body is constant, while the value of gravitation changes, the quantity of matter in a body or its mass is given by the expression

$$M = \frac{W}{g} \quad . \; . \; . \; . \quad (b)$$

Where M stands for the mass of a body, and W its weight, from which it follows that

$$W = Mg \quad . \; . \; . \; . \quad (c)$$

So that while the quantity of matter in a body remains constant its weight changes under the conditions before named.

Remarks.—The term momentum must not be identified with the energy stored up in a moving body, since the latter is stated by

$$\frac{M\,V^2}{2\,g} \quad . \; . \; . \; . \quad (d)$$

where M again means the mass of a body given in pounds, and V its velocity, which gives the energy in foot pounds, *i.e.*, a body thus moving is able to overcome a certain resistance over a certain space, the product of which is equal to the above expression, the resistance being again stated in pounds and the space in feet. The momentum of a body is the measure of the acting force, for by the law of inertia the momentum expressed is equal to the momentum impressed. If an impulsive force (that is, a force which acts for an indefinite short period of time) acts on a body, the momentum generated is the measure of the intensity of the blow. Likewise if two bodies moving with equal momentum impinge direct, they will be reduced to rest. And again, the unit momentum generated by a force in one second, that is a force which, acting for one second on a pound of matter, generates a velocity of one foot per second, is accepted as the dynamic unit of force, termed the absolute unit. Thus the force which acts on a pound of matter for one second, and generates a velocity of one foot per second, generates a momentum

$$M\,V = 1 \times 1 = 1$$

and this is also the value of the force. If another force, acting on the same quantity of matter, produces a velocity at the rate of two feet per second,

$$\text{the momentum} = 1 \times 2 = 2$$

and the second force has double the value of the first, so that momentum is the equivalent for the acting force, or the sum of force increment, termed by Sir Isaac Newton "quantity of motion."

Equation (d) expresses the distance a body will move over against a resistance expressed in pounds before it will come to rest measured from any instant at which a body moves with a velocity V. It may interest the student to know that in the last century a controversy raged for forty years between the European mathematicians as to whether equation (a) or (d) represented the energy of a moving body. Before that (a) was accepted. Leibnitz, a German mathematician, advanced (d), and shortly the whole of Europe was divided upon it; but ultimately (d) gained the victory.

Draw.—If the experiment is attempted to set a lever watch going at what is technically termed "half-time," that is, without the balance-spring, the success of the experiment is dependent on the following conditions:—Suppose the balance starts from rest with a tooth just over the locking-edge, the character of the motion is identically the same as that of connected bodies in Attwood's machine, with regard to determining the accelerative effect of gravity, with the only difference that in the latter the motion is rectilinear and in the former angular—that is, the action of the escape-wheel produces an accelerative effect on the balance. When the tooth passes off the driving-plane, the acceleration ceases, and if frictional resistance were zero, the balance would move on with uniform velocity, which, however, is never realised, hence there is always a retardation—that is, the balance moves with a negative acceleration. If θ denotes the angle moved through before the balance would come to rest, and P the resisting moment, then by formula *(d)*

$$\frac{M K^2 \omega^2}{2 g} = P \theta \quad . \quad . \quad . \quad . \quad (e)$$

Where M is the mass of the balance, K the radius of gyration, and W the angular velocity, hence

$$\theta = \frac{M K^2 \omega^2}{2 g P}$$

If the accelerative effect of the action of the escape wheel is small, the balance will come to rest before the ruby pin impinges against the back of the lever, or the relieving pallet against the relieving spring in the chronometer escapement. Let us consider the result if the balance moves with a finite angular velocity at this instant, first with regard to the chronometer. It will depend on the relative magnitudes of the resistance of the spring and the energy of the balance, as to whether the balance goes on or moves back. In making a chronometer detent the ratio of these opposing forces form a very good guide as to the suitable strength of the springs. When the relieving pallet impinges on the detent, the latter is deflected through a finite angle, until the energy of the balance and the work done in deflecting the spring are equal. The balance is then for an indefinite short period at rest, after which a velocity is generated in the opposite direction, due to the action of the spring, and this velocity, according to (*a*) expressed in circular measure, is

$$M K^2 \omega = \omega \quad . \quad . \quad . \quad . \quad (f)$$

if the mass of the balance, and its radius of gyration are taken as unity, which may be done without error, since the angle described in the unit of time by the same balance is sufficient measure of the strength of the detent. Equation (*f*), that is the left-hand side of it, gives the momentum of a body rotating round a fixed axis, where the symbols have the same meaning as in equation (*e*).

Now the importance of this resisting force will appear evident when it is remembered that it acts opposite to the balance motion at every second vibration. For small displacements we may take the resistance of the detent, as representing the resistance due to draw, whether produced by the action of a tooth on the face of the detent pallet in the chronometer escapement, or the locking planes in the lever, the only difference being that in the latter the resistance acts at every vibration of the balance. If in equation (*e*) we take θ (the Greek letter theta) as the angular displacement of the detent or lever during unlocking, and P at the moment of resistance, then—

$$\frac{M K^2 \omega^2}{2 g} - P \theta \quad . \quad . \quad . \quad . \quad (h)$$

represents the energy of the balance after the unlocking is effected, hence it is evident that it is a disturbing force, and therefore it follows that it is necessary to make the resistance due to "draw," a minimum consistent with the requirement of the escapement, that is just sufficient to prevent "tripping" in the chronometer escapement, and "displacement of the lever" in the lever escapement. In the chronometer the tendency to "trip" is greatest when the balance is vertical, the detent horizontal and below the escape wheel. In the lever escapement we may test the efficiency of the "draw" in the following manner:—Place the escapement in position (without the balance spring is best), hold the movement in the left hand, and guide the balance with the forefinger while the escape wheel is gently rotated in the direction of its motion with a peg held in the other hand. Observe carefully when the acting tooth passes off the driving plane and the next for action drops on to the locking. At this instant allow the balance to move freely, taking care not to impel it in any direction in the act of removing the finger. If the balance moves onward it is clear that sufficient draw exists. If the balance remains stationary there is no effective draw; in that case the reason is best ascertained by placing the wheel and pallet in the depthing tool, so that the action can be observed. Generally it is due to one of two causes, *i.e.*, either the locking planes are imperfect or the escape wheel teeth make undue contact with either pallets or lever. If the reader places a wheel and pallet into a depthing tool and observe the "draw," he will find that the draw before the line of centres decreases in intensity as the pallet dips into the wheel, and the draw past the line of centres increases. In pallets with equidistant lockings, the geometrical draw is made generally equal and in circular pallets, the draw on the disengaging pallet is made greater because the radius is less. Now, assuming the penetration amounts to one degree and run to two, the draw in relation to the direction of motion of the escape wheel is diminished by 3deg. on the engaging locking, and increased to the same extent on the disengaging locking, so that if the measure of draw, usually 10deg. to 12deg., is sufficient in the first, it could be diminished to this extent in the second with advantage.

The accelerative effect of gravity is a most important factor in the duration of an oscillation of a pendulum, which is evident from the fact that the pendulum is used to determine the intensity of gravity at different parts of the globe; thus Captain Kater's experiments in reference to this are referred to in most books on mechanics.

The time of an oscillation is—

$$\pi\left(\frac{L}{g}\right)^{\frac{1}{2}} \quad . \quad . \quad . \quad . \quad 0 \ (i)$$

Where π denotes the ratio of the diameter to the circumference [see (1) in (I)], and L the length of the pendulum, which must be stated in the same measure as G, that is, both feet or both inches. If t denotes the time of one oscillation, T any period in seconds, and n the number of oscillations, the pendulum describes in the time T, then

$$n = \frac{T}{t}$$

Substituting for t its value in (*i*), then

$$n = \frac{T}{\pi\left(\frac{L}{g}\right)^{\frac{1}{2}}}$$

Squaring this expression—

$$n^2 = \frac{T^2}{\frac{\pi^2 L}{g}}$$

$$\therefore n^2 \pi^2 L = T^2 g \quad . \quad . \quad . \quad . \quad (k)$$

$$\text{hence } g = \frac{n^2 \pi^2 L}{T^2} \quad . \quad . \quad . \quad . \quad (m)$$

The thing to be done experimentally is to find L. For this object anything that swings can be used. The principle of interchangability of centres of suspension and oscillation is taken advantage of, that is, some other point is found such that if the body is suspended from this it will perform the oscillation round this in the same time as the first, then the length of the equivalent simple pendulum is given by the distance between the respective parallel axes. When the time of the oscillation about either axes is known, its value is substituted for t in (*m*) and thus G is formed.* Further observations on mass and weight will be made in connection with question (1) in the honours papers of same date of 1880.

(*To be continued.*)

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* The demonstration of the formula (*i*) and others relating to the property of the pendulum will be given further on.

Transatlantic Jottings.

FOR some time an anomalous state of things has existed in the United States with regard to the supply of standard time signals. It has always appeared to us a little incongruous for the astronomical department to be associated with the naval. A memorial is therefore to be presented to Congress, signed by all the prominent astronomers in the States, for its transference from the navy department to a body consisting of scientists and astronomers, who may thus constitute an astronomical department of the Government. Previously the observatories derived their main support from the supply of standard time; but the system now adopted by the Naval Observatory gratuitously, enables the Western Union Telegraph Company to electrically transmit the time much cheaper (although, it is said, with much less accuracy), and will have the effect of rendering useless the costly plants of the observatories, thus driving the University observations from the field.

* * *

THERE has lately been on exhibition in the windows of Filden and Co., Providence, R.I., what is claimed to be the second largest emerald in the world, but we shrewdly suspect that it is something even rarer than would be an emerald of its size—viz., 8oz.—as it was found in a locality not celebrated at all for emeralds, but for another beautiful green stone discovered by Mr. Hidden and named after him Hiddenite. If the latter were the case, it would be a rarity indeed. The largest Hiddenite we remember seeing was about three carats; we knew one of 2½ carats to realise 125dols. per carat.

* * *

THE report of the Bureau of Statistics for the quarter ending December 31st, 1890, presents some remarkable figures, showing a decrease compared with the corresponding three months of 1889, in diamonds and precious stones imported, from 2,636,209dols. to 1,486,107dols. This is probably attributable to the fact that, in 1889, the increased duties seemed imminent and induced importers to buy heavily, and also to the fact that diamonds were then even rather higher than now. The imports of gold and silver jewellery do not show such a falling off. For the corresponding quarter ending 1889 they were 304,040dols. against 290,106dols. in 1890. There was also a slow importation of clocks after the passage of the McKinley Act, due to the feeling which existed in the minds of many that the Act would not run. As soon, however, as they realised its permanency, an increase in imports set in.

* * *

AN enterprising New Yorker has invented an electrical stand for the exhibition of diamonds, which keeps on an eternal oscillation. The stones thereby attract a larger attention from their scintillation than could possibly be obtained if they were at a standstill. We suggested, and even had made, a similar arrangement many years ago. It requires but a very small battery to keep a window in full scintillation, and needs no attention for many months.

THE *grippe*, or influenza, is playing sad havoc all round the watchmaking and jewellery trades.

* * *

THE Canton *Democrat* says:—"The Dueber-Hampden Company, if run to its full capacity, can make a yearly profit of from 400,000dols. to 500,000dols. In 1888 the Elgin Company divided in profits 987,000dols.; in 1889 it divided a trifle over a million. Last year the profits were not quite so large, but still enormous.

Round the Watch Factories.

THE Elgin Watch factory are now turning out over 50,000 watches per month.

The Waltham Watch Company in a little over 30 years, claim to have turned out over 5,000,000 watches.

The Waltham Dial Company are going to extend their factory two storeys. Another wing is to be added to the United States Watch Company's building. The Waterbury Clock Company are also about to enlarge their establishment by a new five-story building, 100ft. by 69ft.; it is to have a high tower in front, surmounted by a flagstaff.

The Canton factory is now running full time, with nearly 3,000 hands.

The Columbus Watch Company, having secured all the additional capital they required to ensure their stay in Columbus, have increased their stock to half a million dollars.

It is said there is every possibility of a new factory being built at Warren, R.I. Mr. Goff, the proprietor of the Warren Hotel, agreed to contribute the land; and Mr. Martin, a contractor and builder, will erect the building and receive his payment in shares, providing the originators can obtain 300,000dols. of the 500,000dols. capital outside of Warren.

The Electric Signal Clock Company, of Harrisburg, Pa., has been granted a charter with a capital of 50,000dols.

MESSRS. STAUFFER AND Co. received at the beginning of this year the much coveted first prize delivered by the State for the exceptional result obtained by them at the Observatory of Neuchatel. This firm, always keeping to the front, have now brought to the world a new watch, which, judging from the advertisements in the daily press, is likely to revolutionise the watch trade. It is a watch made so perfect by extra fine machinery that its accuracy leaves nothing to desire. Placed at the Kew Observatory by dozens, the results are most extraordinary, showing to what perfection machinery has come to to make such watches. The most astonishing part of it is also as regards prices, when it dawns upon one that a Kew certificated watch in silver cases can be retailed at £5. There is no question about it, that there is a big future before Messrs. Stauffer and Co. for such a watch, for which they have made ample provision.

WALTER BROCKLEBANK (30), watchmaker and jeweller, has been remanded at Birmingham, on the charge of illegally pawning four gold watches entrusted to him by Mr. Barnett, jeweller, Hockley-hill.

THE firm of Lucas Bros., jewellers, Birmingham, has been registered as a limited liability company, with a capital of £5,000 in £5 shares.

The Watch Trade and the Merchandise Marks Act.

A MEETING of the members of the watch trade, under the auspices of the Watch Trade Section of the London Chamber of Commerce, was held at Botolph House, Eastcheap, London, E.C., on Friday, May 15th, when several important matters in connection with the trade were considered The particular object for which the meeting had been called was, according to the agenda paper, to receive the report of the joint committee appointed at a meeting of the London Chamber of Commerce on March 3rd, "To consider the desirability of proposing an amendment to the Bill for Amending the Merchandise Marks Acts, which was to be introduced by the Board of Trade, in order to define more clearly the obligations of the watch trade under the Act." The meeting was also called upon to decide what action, if any, should be taken with regard to the report. Mr. H. M. Frohsham occupied the chair, and the attendance was rather small. The Chairman, in commencing the proceedings, reminded the meeting that on March 3rd the London Chamber of Commerce had appointed a number of gentlemen as a committee to co-operate with the committee of the Watch Trade Section of the Chamber in considering the desirability of proposing an amendment to the Bill for Amending the Merchandise Marks Acts, which was to be introduced into the House of Commons by the Board of Trade. The joint committee met on April 10th, and after a very long discussion a resolution was passed embodying the views of the committee on the question, and which the present meeting had been convened to consider.

The Secretary, Mr. K. B. Murray, then read the resolution, which was as follows:—"That where in an English watch and clock-watches, or their combinations, such as repeaters, calendar chronographs, the complicated parts are made abroad, the movement should bear the indication of the foreign origin in such words as "repeating work," "chronograph work," "perpetual calendar work, made in——" (the country of origin). The speaker pointed out that there had been two bills before Parliament, the object of which was to insist upon all articles imported from abroad being marked so as to indicate exactly the country of origin. One of the bills had been dropped, but the other had yet to be brought forward. The Council of the Chamber of Commerce had petitioned very strongly against the Bill, and the general feeling of the trade seemed to be dead against it.

The Chairman remarked that in his opinion the resolution passed by the joint committee did not amount to proposing an amendment which would define more clearly the obligations of the watch trade. (Hear, hear). After the long discussion which took place at the committee meeting, they did not seem to come to any definite conclusion, and the resolution they had passed after all only amounted to advising the trade how to proceed in order to avoid trouble to themselves. In no sense did it define the obligations of the watch trade; in fact it only referred to one branch of work.

Mr. Brooks said he presumed that there should be a resolution that the report be accepted. He had great pleasure in proposing that, because it appeared to him that the committee had arrived at the most just conclusion they could under the circumstances.

Mr. Gent seconded the resolution, but wished to know whether any action they took that day would be binding in the future. The question they were discussing was a very vital point to the watch trade, more especially to high-class workmen in London. He would like the meeting to come to some decision with regard to distinguishing marks, as he feared that the more important branches might suffer for want of employment unless some decided action were taken with regard to the question.

The Chairman pointed out that the subject had been already thoroughly discussed, and it was agreed that the matter should be left entirely to individual manufacturers to decide upon in accordance with their own judgment.

Mr. Cashmore said that before the resolution was passed he should like to make a few remarks. He had hoped that the meeting would have arrived at some more definite conclusion than they had done. Having been present at the meeting of the joint committee held on April 10th, and having had the advantage of hearing the various opinions expressed by members of the trade, he was of the opinion that it would be perfectly impossible to get every member of the trade to agree to some definite rule. He thought it was obvious, from the discussion which took place at the committee meeting, that there was a great variety of opinion, and that it was impossible that so small a committee could adequately represent such a trade as their own, or bring the various members to agree together. Although he had desired to see a different decision arrived at by the committee, yet he thought they had done the best they could under the circumstances, and had taken the best course open to them. He did not see that any good could come from further action in the matter.

The Chairman then put the resolution to the meeting, and it was carried unanimously.

The Secretary remarked that the only action that could be taken by the meeting with regard to the decision arrived at was to give publicity to the resolution in the papers.

Mr. Clemence, in proposing that this should be done, said he thought it was very desirable that the trade in general should know the decision arrived at at that meeting.

Mr. Jones seconded the resolution, which was carried unanimously.

Mr. Brooks referred to the small attendance, and said he did not think it ought to be ascribed to the apathy of the trade. He thought that to the approaching holidays and the inconvenience experienced by members in leaving their business was attributable the few persons present that day.

Mr. Cashmore remarked that with regard to foreign movements with the complicated work there seemed to be a difference of opinion as to whether it was necessary under their resolution to mark watches "foreign movement" besides "foreign repeating work," or whether "foreign movement" would cover the repeating work as well.

The Chairman remarked that he would be sorry to have to decide upon such a point.

Mr. Brooks pointed out that the Act was sufficiently explicit to decide what should be done in such cases.

The Chairman, in replying to a vote of thanks for presiding, said that that meeting was to strengthen the weak, to frighten the unscrupulous (although, of course, they could not imagine that there could be any such in the watch trade), and to encourage those who were dealing fairly, and if by the decision of that meeting any person would be enabled to conduct his business with more security, then that section of which he (the speaker) considered himself a most unworthy representative, would be amply satisfied.

The proceedings then terminated.

A HANDSOME shop has been built for Mr. Mallard, the well-known jeweller, at the corner of Piccadilly and Brunswick-street. The architecture is classic and tasteful, and a prominent feature is a clock turret with a circular balustraded oriel window. The clock, which was made by Messsrs. Evans and Son, of Birmingham, has a four-foot dial and strikes the Westminster chimes. As for the interior of the establishment, it has been fitted up at a cost of about £400, and the stock is as perfect as keen buying and sound judgment can make it.

Scientific and Otherwise.

Nickel in the Future.

THE results of the trials of nickeliferous steel armour plates in resisting heavy shot by the United States Ordnance Department, at Annapolis in September last, were so satisfactory and so important that a bill was hastily passed through Congress appropriating one million dollars, with which to secure control of the visible supply of the metal. If the governments of other countries should become as favourably impressed with its increased powers of resistance, we are not at present able to predict to what extent the price of this now very cheap material may rise. The principal supply for many years was from Germany and New Caledonia, although North and South America, Canada, and numerous places in Europe, including Cornwall, furnished their quota. It is, however, estimated that the annual production of nickel did not exceed 1,000 tons, nearly half of which was claimed to be used by the United States. Doubtless, when a demand is created, it will be much more sought after. There are well known nickeliferous deposits which, at the time of their discovery, were too far inland and away from any railway service to be considered worth working, such for instance as those in the Province of Ontario, which have been known this fifty years; but at the time of the discovery, needless to say, there was no railway communication with them. Since then the country has been opened up by the Canadian Pacific Railway, and doubtless these remarkable deposits will mitigate any extravagant flight upwards in the price of nickel, although it has sometimes doubled in price in five years, notably in 1870 and 1875. It might, however, be interesting to know that this metal, unlike gold and silver, is not found native, but occurs in association with other metals, etc. Its ores are sulphides, arsenides, arseno-sulphides, antimono-sulphides: a sulphate, arsenate, silicate, and carbonate. It is more often discovered associated with cobalt, with which it presents many features in common. In the district above named it is associated with pyrrhotite and chalcopyrite, and varies considerably in amount, the average being in some instances 3 per cent. nickel and 5 per cent. copper; while in others it may run up to 20 or even 30 per cent., and the copper 12 to 15. It is also important to notice that the ore can be smelted as it is found, requiring no admixture of fluxes, a point of great importance in many localities. It is claimed (but we should think there is a great mistake somewhere) there are now about 650,000,000 tons of this ore above ground, although the working of the deposit is only in its infancy, and from what we know of the geology of the district, from the work of the officers of the Geological Survey and other friends who have visited the locality, the nickeliferous deposit may extend the whole length of the Huronian belt in which it occurs, and may thus be over 600 miles in length. The development of these mines, too, may make an important impression upon the copper market; for, as before shown, the two metals occur in one ore.

More El Dorados.

ACCORDING to our American contemporary, *The Western Jeweller*, Salt Lake City is in a fever of excitement over the recent discoveries in the Deep Creek region, and hundreds are leaving for the scene every day. A stage line has been opened from Stockton, on the Union Pacific, to the town of Clifton, a small camp at the terminus of the new railway, and the new outfits are leaving every hour.

The recent strike in gold was made by a prospector in the employ of Councilman L. C. Karrick, one of the wealthiest mine owners in the West. Some months ago Karrick employed his man to develop some mines that he owned in the Deep Creek region, and while grubbing around in the canon he discovered a very rich piece of float which he sent in and had assayed. The result was so astonishing that Karrick told him to find where it came from, and to devote all his energies to that end. The float was from a formation very unlike that in the neighbourhood in which he was working, and when the vein was found it was a good distance off and in an entirely different sort of rock. It is rose quartz and is "literally lousy" with the precious stuff. One man, so it is said, saw in one day a piece of ore which will weigh about eight ounces, which is two-thirds gold. It was a companion piece, so it is said, to that which the assay was made from, and the result, as announced by J. C. McVickers, one of the leading assayers in Salt Lake City, is given as 13,124 and 99-1000 oz. of gold per ton, or in money 271,317.31 dols. The streak is from four to seven inches thick, and is exposed for 100 feet. As a matter of course it will not be expected to pay the entire distance as from this sample. But it is conceded by all the miners in the country to be the best thing that has ever been discovered in his section. As soon as the result of the assay was made known Karrick dispatched a wagon and men to the scene, as such a strike as that is too valuable to be left unguarded. The news spread like wildfire, and since that day every man able to get away has rushed for Deep Creek.

The *Jewellers' Review*, however, has a news item more extraordinary than the foregoing. It says the long-lost Breyfogle mine, which has been claimed by many to be a myth, has been discovered at last by George Montgomery, an old Colorado miner. Every Californian prospector is familiar with the story of the Breyfogle mine. It ranks with the Gunshot, the Pegleg, and the Lost Cabin legends. Like them, it has cost dozens of lives. The story goes that in the early '50s a party, in which was Breyfogle, set out for California by way of a Southern Utah road. Breyfogle, while prospecting in a wild region, found a place where he could literally dig great nuggets of gold out of decomposed quartz with his knife. As he described the place, there was a large deposit of exceedingly rich ore—enough to make the whole party wealthy. The travellers were short of provisions and water, and the Indians troubled them, so there was no time to waste in mining. They pushed forward, but between Indians and thirst only a few reached civilisation. Breyfogle told his story, exhibited his nuggets, and then spent the rest of his life in a fruitless search for the deposit. Others who heard the story followed his example, and for upwards of forty years the Breyfogle mine has lured men to destruction in the terrible deserts. Something like five months ago George Montgomery, well-known in the Wood River region of Idaho, was on a prospecting trip in the region to the South-eastward of Death Valley. While prospecting in Pahrump mountains, Montgomery made a discovery early in January which bears every indication of being the long-sought Breyfogle mine. The location corresponds with that given by Breyfogle, while the gold has been just as he said—so plentiful that it could be dug out in nuggets with a knife. The ledge is eight feet wide and has been traced 9,000 feet. In the decomposed surface rock the gold is found almost like plums in a pudding. Pieces of quartz picked out are from a quarter to a half bright yellow gold, while with a hand-mortar the lucky discoverer pounded out in a short time a yeast powder can full of nuggets of various sizes. All along the ledge free gold is found in quantities that astonish the oldest prospectors and which seem scarcely credible. After making several locations, Montgomery spread the news of the discovery, the result being that some thirty or forty miners are now at work in the valley, while others are hurrying in from various directions. Montgomery himself picked up the richest specimens, and made his way across the desert to Daggett, the nearest railroad point, 160 miles. From there he came to San Francisco, where he is getting tools, supply, etc., to open the mines. It is a poor man's camp, the ore being easily worked, and fortunes are sure to come to those who strike a good deal.

Discovery of Diamonds in British Territory.

A DISCOVERY in many ways interesting is that lately recorded from Demerara, British Guiana, where between 600 and 700 diamonds have been found by one man, others also having shared a similar fortune. They are reported to be of good size, fine quality, and very valuable, and similar to the Brazilian stones, *i.e.*, they are river stones. At first thought one might be disposed to think they might be derived from the same source, since the Brazilian rivers extend into British territories, and more especially so since the researches of Professor Darby have shown the diamond is not in its original matrix in the Itacolumite series, but only occurs there as a derived pebble; but it must be borne in mind that the diamond bearing region, as at present known, lies some 30deg. south of this district, and is separated now by several mountain chains and water sheds, so that if they really do come from the same undiscovered source, they were distributed in past geologic times by rivers having no relation to the present configuration of the country, and before the present mountains were brought forth. Of course there is nothing to say that such could not have been the case. We know that there are large pebble-beds in our own country that were brought from afar before almost any of the mountain chains existing to day had risen from out the azure main. But it is far more probable that there are several centres from which diamonds have originated, that they have been brought up from the interior of the earth by volcanic action, where native elements are known to exist in a similar condition to that in which they are found in meteorites, where the elements including carbon are found native and crystalline.

Prodigious Cat's-Eyes.

LATELY reports have reached us of the finding of a number of prodigious cat's-eyes. We should like to see them before repeating what is current about them. It is said the finder, although once very poor, has met with a continued sequence of unheard-of luck. A few months ago he is said to have found one which he sold for £1,250, and another for £2,500; another one reached pounds in weight, and another that he now values at £40,000, and for which a syndicate are reported to have offered £19,000. But customers for a £40,000 cat's-eye require quite as much finding as a gem.

Burma Rubies.

THE public were a little curious to know the reason why the Burma Ruby shares kept on the rise a short time ago, a proceeding they had not enjoyed for a long period. Shortly afterwards, however, the report was issued that a number of good stones had been found, and a quantity of geminiferous earth had been obtained.

* * *

Piercers, and all using a saw-frame, should have a look at the Instantaneous Saw Grip, described in a previous number, an illustrated advertisement of which appears elsewhere. It is meant to supersede the ordinary screw, being much easier and quicker to work, as the saw is made fast in the frame or released from it in a moment. The price appears to be very reasonable, in view of the good workmanship of the invention.

Death of a well-Known Gem Engraver.

ALTHOUGH we have an instinctive abhorence of sighing for the flesh pots of Egypt, or looking back upon the past as "the good old days," we certainly must admit with pain and regret that there certainly does not exist to-day masters of the Glyptic art, whose works stand out as achievements of consummate skill above everything else that is being produced around us, as do some of the engraved gems that have reached us from various periods. Still, here and there, we get a man who rises above his contemporaries, and produces many works of which we may not be ashamed in the distant future, even when under the critical eye of the archæologist. Such a man was Henri Michel Chapu, who died in April, at St. Germain, France, at the age of fifty-one. He was a pupil of Pradier and Duret, and many of his engraved gems, as well as his sculptures, are reckoned amongst the art treasures of France. All things considered, the Glyptic art represents the most delicate and impressionable work of all the Fine Arts, and we only wish it enjoyed an appreciation proportional to that under which its relatively unenduring sister—Painting—is fostered: we should then, no doubt, produce some imperishable objects of art which would command admiration when the pictures, which now run close up to six figures in value, lie moulding in the dust.

Death of our late Editor, Mr. Glasgow.

MANY of our readers will share in our sorrow to hear that the dire disease, that has been lurking around with such disastrous effects on all sides for the last two years, has claimed, as one of its victims, our late respected Editor, Mr. Glasgow. He had only returned from Belgium a few days, and although not feeling as well as usual, he merely attributed his slight illness to a cold, and was able to go out on the 16th, but on the next day, sad to tell he had joined the majority, at the early age of 34. Being a son of Mr. David Glasgow, whose name is so honourably associated with British watchmaking in its various departments—being in turn a practical man and an author—it was only natural to find in the son some inheritance of the genius of his father. It was his father's wish that he should be a watchmaker, and with that object in view he worked at his father's benches, acquiring a thorough practical knowledge of his business. But his literary instincts forced themselves to the front, and led him to undertake the editorship of this journal at a period when it was infinitely less valuable as a trade organ than it was when his connection with it ceased some nine months ago.

Mr. Walter Cross, watchmaker and jeweller, of 62, High-street, Bloomsbury, has a keen appreciation of the effect of a gorgeous display in the matter of advertising one's business nowadays. His latest move in that direction is to perambulate the whole of the west-central portion of London with a miniature horse and trap accompanied by two very small boys got up in the most resplendent fashion. Wherever this turn-out appears it is bound to attract attention, especially on a fine day, when the sun's rays striking on the gaudy colour of the trappings throws off the scintillating light.

There has lately been exhibited for sale, in the shop of a York jeweller, a silver vase which bears an inscription to the effect that it was presented, as a mark of affection and esteem, by Dr. Rowley Hill, the late Bishop of Sodor and Man, to Dr. Thompson, the late Archbishop of York. Surely, considering that the archbishop left about £50,000 behind him, his executors might have refrained from allowing a personal gift of this description to be hawked about; but, at the same time, we admire the enterprise of the tradesman who is showing it.

The Crystallography of Gems.

By W. J. Lewis Abbott, F.G.S.

(Continued from page 240.)

The Trimetric System.

The Natural Forms of Topaz.

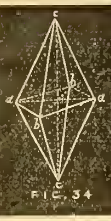


FIG. 34

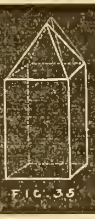


FIG. 35

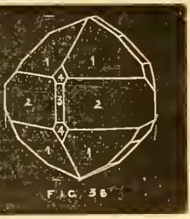


FIG. 36

We are now brought to the trimetric system, the name of which is derived from the fact that the three axes are of three different lengths in its typical form, as shewn in Fig. 34. This is a double pyramid built upon a rhombic base: there are three axes, as in the last system, similarly disposed; but owing to other properties and characteristics, it is necessary to keep these distinct, and to know of which axes we are speaking when describing any crystal. There must, therefore, necessarily be some uniform method of speaking of these: the one lettered a joins the longer diagonal of the rhomb, hence it is called the macrodiagonal; b joins the shorter diagonal, hence called the brachydiagonal; whilst c is called the vertical: and in employing or describing these axes they are always taken in that order. The necessity of this becomes apparent when we study the optical properties of gems, for in some crystals the principal axis runs through one of the shorter axes, so that the natural position of the crystal is horizontal so far as outline is concerned. This pyramid is regarded as the only whole or complete form in the system. It is bounded by eight triangular planes, each of which cut all these axes at some distance, although that distance may vary.

By extending the length of either of these axes we may elongate the crystal in any direction to any extent, in fact to infinity. If the axis, say c, were so elongated downwards, it is evident that the now triangular faces would be correspondingly elongated in their point of direction, or, in other words, they would be parallel to it, and the result would be a prism upon a rhombic base. Prisms in this system are thus considered incomplete forms, because there must be other planes, or faces, present to complete them as "two parallel lines cannot include a space." There are two orders of prisms; one upon a rhombic base as just described, where the lateral axes join the angles diagonally, and one upon a rectangular base, in which case the lateral axes join the centres of opposite faces, or the two may occur combined. If we similarly elongate say the macrodiagonal (*i.e.* the longer of the two lateral) axis to infinity, we should transform the apex of the crystal to a line running parallel with the girdle, forming as it were a house roof, hence the prism thus originated is called a macrodome. If we similarly extended the brachydiagonal we should get a house roof running in the opposite direction, and called a brachydome. When a form is "unfinished," as in the case of the prisms just described, their truncating faces are called pinacoids, and because these form the base of the prism they are called basal pinacoids. When planes (or faces) so end or truncate the brachydiagonal axis parallel to the macrodiagonal, they are called macropinacoidal; and when they similarly truncate the macrodiagonal, they are called brachypinacoidal. In describing the rhombic prism, we only noticed its coming into existence upon the extension of the longer axis c, but either of the lateral axes might be altered in relative length. If the macrodiagonal axis be elongated the prism is called a macroprism; if the brachy, then it is called a brachyprism. These three prisms with the other two, the macrodome and the brachydome before enumerated, give five forms of rhombic prisms belonging to this system, in all of which, or combinations of them, topazes are found. The union of macrodomes and brachydomes gives rise to right rectangular pyramids. We thus see that gems crystallising in this system may approximate in outline members of the preceding system, yet be very different from them in relation to the axes, and hence in their optical properties; and were it not for the fact that I hope to treat fully of the optical properties of gems in a subsequent series, I should not have burdened the reader with what he may at present regard as dry detail, but the indispensability of which he will fully realise subsequently.

The simplest form of topaz is a rhombic, or a rectangular prism, terminated by a pyramid, formed in the first case by the faces of the typical octohedron, and in the second by the union of the macrodome and brachydome. Fig. 35 shows one of these simplest forms, viz., a right rectangular prism surmounted by a pyramid, composed of the union of the macro and brachydomes, truncated by a basal plane, which is usually the case with topazes that come into the market; for their cleavage, being so perfect and being almost always found attached to the rock, they break off at right angles to the prism, which is the direction of their cleavage. This cleavage face is always a feature in topazes; it is sharp, bright, level, and clean: it thus therefore differs from prismatic faces, which are invariably still brighter and deeply striated, or one might sometimes call them longitudinally facetted. On many topazes now before me I can easily recognise from twenty to thirty of these facettings upon each face, sometimes making them rounded in outline. Fig. 36 is given as an illustration of the more complicated habits and the different aspects presented by the development of the crystal in the brachydiagonal zone. The faces marked 1 are those of the typical pyramid; 2 are those of the rhombic prism; 3, those of the right rectangular prism. We have thus both orders of prisms present, although the latter is only very sparingly represented; it might, however, just as well have been as much so as is the larger. This latter is followed above and below in the same vertical zone by 4, faces of the macrodome. The other three faces above and below on the right-hand side represent a series of brachydomes of various altitudes, which rise in step-like elevations; a large number of these steps are often present in pyramids of each kind, just as we observed was the case in the longitudinal facetting of the prism.

In neither of the figures have we illustrated the basal pinacoid, although, as we previously remarked, it is frequently present.

(To be continued.)

Hall-marking of Silver Plate, with Special Reference to India.

(Continued from page 241.)

A Paper read before the Society of Arts, January 22nd, 1891.

By Edward J. Watherston.

The Conclusion.

To conclude, I submit that the time has arrived for a thorough reform of our laws. It is a recognised fact that Hall-marking, one of the most ancient institutions of this country, is a good one, and there is not the slightest proposal for abolishing it; but it should no longer be compulsory. At present it is partly voluntary and partly compulsory, with the effect that during the last ten years 4,570,000 ounces have been marked under the former principal, and 6,600,000 ounces under the latter—the former simply under the law of supply and demand. The argument is manifest that, if the public demand and get a mark in the one case, they would get it in the other. One result of reform would be to open the export door, now closed, to British enterprise. But, under a system of freedom, new uses might be found for silver not necessarily of standard quality. Furniture might be ornamented with silver; silver might be used artistically together with other metals, a combination now illegal. Under a voluntary system further reforms would quickly follow. The "touch" has been already referred to. The practice of breaking goods sent to hall, in the event of their being below standard, is a relic of barbarism, and should be abandoned; it would be unnecessary under a voluntary system of marking. The "date" mark is objectionable; it simply proclaims goods to be "old stock," if they be not quickly disposed of. True it is that the second-hand dealer of to-day trades upon "old marks," to the delight of collectors, and that Elizabethan plate, however ugly, has a trade value of £20 per ounce, as a result of the mark alone. Personally, I enter a protest against perpetutating a system only useful to second-hand dealers of future generations.

> "As though there were a tie,
> And obligation to posterity,
> We get them, bear them, breed and nurse;
> What has posterity done for us
> That we, lest they their rights should lose,
> Should trust our neck to gripe of noose?"

Far better that we should leave to posterity good work, of really artistic merit, than work, the only value of which is comprehended in a date mark.

The "locality" mark is even more objectionable, as, practically, it creates a monopoly for the London mark, which is preferred by dealers, as signifying "London made." Sheffield manufacturers constantly send goods to be marked in London, so that they may be sold as "London" made. The trade stipulates for the "London" mark. The maker's mark is also open to objection. At present, if there be several partners in a firm, the initials of all the partners have to be stamped on goods. A registered "trade-mark" would be far better. In point of fact, in the case of silver, all that is required is the "trade-mark" of the maker, and the "lion," signifying standard, and, if a lower standard be adopted, some device indicating that standard. In the case of gold wares, the "trade-mark" and figures indicating the quality—22, 18, 15, 12, or 9 carats fineness, and perhaps a "leopard's head"—would suffice. These are details best settled by the Board of Trade. The license tax, of course, should be abolished. The only *raison d'être* of this tax was because traders dealt in excisable articles. The duties having been abolished, there is no *raison d'être* whatever.

(To be continued.)

Gold Caskets Abound.

One of the largest orders for gold caskets that has been afloat for a long time was the one recently executed by Messrs. Barnett and Scott, Court jewellers, Grimsby. They were five in number, and were made to contain the beautifully illuminated freedom of the City, which was presented to five distinguished gentlemen. The design and execution of the caskets do great credit to Messrs. Barnett and Scott, and are what such things should be, intimately associated with their place of origin and their respective recipients.

Another casket of great originality and beauty was the one lately executed by Mr. Sharman D. Neill, of Belfast, which contained the address presented by the inhabitants of Belfast to the present Earl of Shaftesbury, upon his attaining his majority. Both address and caskets were carried out from designs of a highly artistic and novel character, supplied by Messrs. Marcus Ward and Co., of Belfast. The address fills a large handsome volume of fine vellum leaves, brilliantly illuminated throughout, bound in dark-grained Levant morocco, and containing many miniatures of notable places in and about Belfast. The casket to contain the illuminated address is made of oxydised silver, parcel gilt, and stands about 16 inches in height. The design is unique in its way, and highly attractive, having been reproduced after the model of an ancient Irish shrine—the Shrine of St. Patrick's Bell—elaborately wrought in intricate patterns of whorles, knots, bosses, and bewilderment, interlacement of lines, and strange braconic forms of lines of Opus hibernicum. The front has in the centre the armorial bearings of the Earl of Shaftesbury in repoussée; on the opposite side the arms of the City of Belfast occupy a similar position. An inscription in Irish characters, "Sir Anthony Ashley Cooper, ninth Earl of Shaftesbury; presented by the citizens of Belfast," is arranged on horizontal bands. On the ends appear, side by side, the shields of the Marquis of Donegal and the Earl of Shaftesbury. The interior is lined with maroon Irish poplin, embroidered with special device.

Still another gold casket was made by Messrs. P. G. Dodd and Son, of Leadenhall-street, to contain the freedom of the City of London presented to Mr. William Lidderdale, Governor of the Bank of England, in recognition of the astute and able services he rendered during the late financial crisis. As might be expected from the firm of Messrs. Dodd, who have paid more attention to the science and art of their profession than most members of the trade, the design showed departures from the ordinary stereotyped and conventional method of treatment. These caskets are almost invariably mounted on a bright velvet plush, which soon fades and shortly perishes altogether. We have long advocated the use of ornamental stones for this purpose, and the casket under consideration is a magnificent example of what can be done in this direction. Advantage has been taken of those beautiful specimens of calcite known as the rich "Algerian Onyx," whose translucency contrasts admirably with the 18-carat gold work of the article that rests upon them. Nor did it end there. Drafts were made upon the domain of decorative stones for panels; so that, altogether, this is one of the finest examples of a casket that has been turned out for a long time.

There is another one now in process of manufacture, to hold the address to be presented by the Corporation of London to the German Emperor, at the Guildhall, on Friday, July 10th. The work has been entrusted to Messrs. Mappin Bros., of 46, Cheapside, and we hope to describe it later on.

Mr. J. H. Robinson, the well-known jeweller, Gold-street, Northampton, has been fortunate enough to secure a very handsome silver-gilt milk jug and sugar bowl, which can be seen in his window. Both articles were the property of King William IV. and Queen Adelaide.

Presentation to Mr. Thomas Baxter.

A MEETING of unusual interest in connection with the Watch and Clock Makers' Pension Society was held on the 27th April at the Horological Institute, Northampton-square, E.C., under the presidency of Mr. Joseph Walton. There was a crowded attendance. It being the half-yearly general meeting, the usual business was transacted. The first was the election of one of the eight candidates to the vacancy of pensioner, the successful applicant being an old member of the craft, named Sanders. The Chairman then proceeded to allude to that part of the evening's programme which had brought so many of them together on that occasion, viz., the recognition of the long and invaluable services of their esteemed treasurer, Mr. Thomas Baxter, by presenting him with an illuminated address. In Mr. Walton the society has a warm advocate, and in the course of his speech the Chairman gave an outline of the history of the society during the seventy-four years of its existence, stating that in that period 240 aged and infirm watch and clock makers or their widows had been relieved and benefited. In tracing the ups and downs of the society he showed Mr. Baxter's indispensable connection with it, and paid him many high tributes of praise. He had to regret that of late years the finances of the society had gone back, which he attributed to the bad state of trade in Clerkenwell, observing, however, that there was no man who had worked harder to stem the backward tide than he whom they had met to do honour that night—a remark which brought forth loud applause. He also gave Mr. Baxter the credit of being the prime mover in a successful effort three years ago to augment their funds, by the dinner, which netted £230; and further, that he had been the principal means of getting Major Lambert's sympathies and cash for the society, remarking that it appeared that the more difficulties cropped up, the more Mr. Baxter bent his back to the burden. They had therefore met that night to ask him to accept the address as an expression of the appreciation of the committee and subscribers, of his good deeds, which he had but poorly set forth, but which were known to all.

The address was handsomely framed, and was worded as follows:—

To Thomas Baxter, Esq., Treasurer of the Watch and Clock Makers' Pension Society.

Dear Sir,—We, the undersigned, on behalf of the general committee of the above society, desire to assure you of the high esteem in which you are held by them, both for your untiring zeal and devotedness to the welfare of the institution, and more especially for the successful issue of the effort made in December last, whereby its funds were largely benefited. Trusting that you may long be spared to aid so good a cause, we are, yours sincerely,

Joseph Walton, Chairman.
April 27th, 1891. John Pass, Vice-Chairman.

Mr. Baxter, upon rising—which was the signal for loud cheering—thanked the committee and subscribers for the kind and flattering reception, and for the very handsome testimonial presented to him. He assured them that all he had done for the society was a labour of love and pleasure. He fully recognised with pain the fact that the funds had decreased, but he also recognised that it was no use sitting down and looking at a dwindling exchequer. They were very much indebted to Major Lambert, Capt. Penton, M.P., and Earl Compton for their assistance (applause), and he was pleased to say that during the five years he had acted as their treasurer, £520 had been added to the funds of the society, independent of the subscriptions. (Cheers.) Reverting once more to the testimonial, he became somewhat pathetic, observing that he was sure it would be gratefully received by one dear to him at home, and he hoped it would prove an incentive to his sons (who were then present) to do what they could in the cause of charity. (Applause).

The election of officers was then proceeded with.

Mr. Daldorph proposed, and Mr. Beard seconded, the re-election of Mr. Baxter as treasurer of the society.

This was adopted unanimously, Mr. Baxter returning thanks.

Mr. W. H. Johnson proposed, and Mr. Meek seconded, that Messrs. Franklin, John Woodman, and Connell, the retiring trustees, be re-elected; and this was agreed to.

The Chairman proposed the re-election of Messrs. Benford, Crackett, Homewood, Newman, and Taylor as committeemen, which was adopted.

Mr. Pass moved, and Mr. Douglas seconded, the election of Messrs. Corke and Harwood in the place of Messrs. Cotton and Moore.

This was adopted, and Mr. Corke returned thanks.

Mr. Walton proposed that Major Lambert and Captain Penton, M.P., be elected vice-presidents of the society.

Mr. Spring proposed that Earl Compton, M.P., be added to the list of vice-presidents.

All the nominations being cordially adopted, a vote of thanks to the scrutineers and Chairman closed the proceedings.

The New Coventry Watch Case Manufacturing Company, Limited.

WE have very great pleasure in calling the attention of our readers to the fact that some of the principal manufacturers in Birmingham and Coventry have agreed to form a company for the manufacturing of watch cases in a scientific and business-like manner, similar to that done in America and Switzerland. All who have to do with watch manufacturing are fully aware of the great nuisance, expense, and waste of time now incurred in obtaining a case which, under existing circumstances, generally goes through several hands, with loss of time and cost of transit between each operation. But the above company intend making, by the newest and most improved machinery, the case complete in every part, including springing, polishing, engine-turning, etc. The business starts on the nucleus of that carried on for the last twenty years by Mr. R. J. Pike, of Coventry. In addition to this it will have the sole right of the use of Turner's Safety Watchbows and Pendants: a point of considerable importance when one remembers how objectionable is the method now generally employed; and also that of two valuable patents relating to watch keys and swivels. It has long been pointed out by watch manufacturers that no greater need existed than the production of cases with this bow. As soon as it was placed upon the market more than one firm expressed their intention of not making any watch cases without it. We can therefore heartily congratulate the directors in securing so valuable a patent in connection with machine-made cases, and we hope to see the company get into working order very quickly; and we are sure, from our intimate connection with the watch trade, that the birth of this company will mark an epoch in the history of watchmaking in this country. Every month we try to impress upon the trade the extensive lines on which things are being done in America. And now that we have in operation the Merchandise Marks Act, our eyes will no longer be disgusted with the sight of pecks of Swiss cases sent over here, to be marked with the English hall-mark. This latter fact also further establishes the necessity of such a company, and we only desire to see it followed very shortly by the united energies of our movement manufacturers, in the establishment of a factory, backed by sufficient capital, and fitted with all the latest machinery, capable of turning out movements in such a manner as may ensure us being considered *the* watch-producing country of the world.

The Markets.

DIAMONDS.

Despite the rumours and counter rumours, concerning the probabilities and possibilities of the Wesselton Mine, and the great finds up country, the price of diamonds has not been materially affected, and if a little easier at some parts of the month, at others they have been equally tight, and no sign at the present exists of any permanent decline in their price.

SILVER.

There has been one thing that has characterised the price of silver during the whole of the month, and that is its approximation to 44d.; during the greater part of the month it has been at what it is now, 44¼d.

IVORY.

At the ivory sales for the May quarter, the supply on offer was very small, and although there was a sharp competition, even then some was withdrawn at the reserve price set upon it, which was considered by all buyers too high. East Indian on the whole was from £1 to £6 higher, although defective and cut hollows were generally lower. The West African shows a slight decline on the sales of January. A great deal of the Egyptian was withdrawn, but both hard and soft were about £2 up.

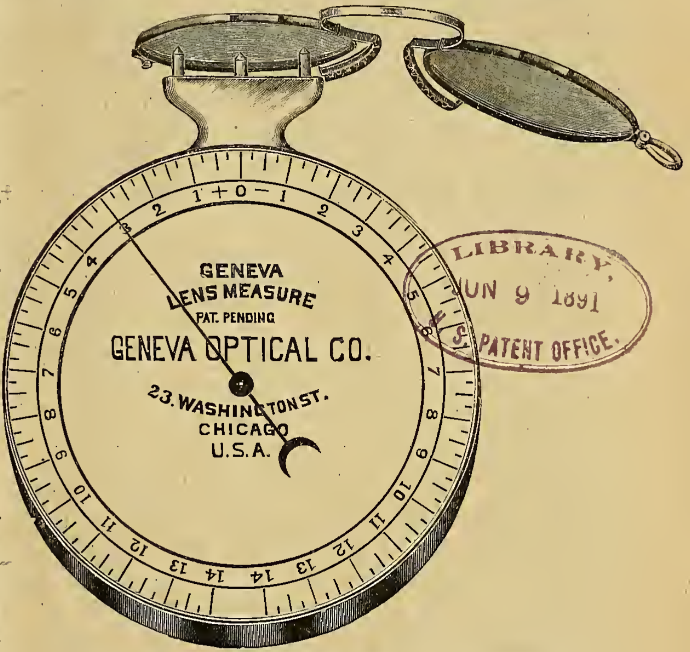
Sale or Approbation.

A case of some interest to jewellers, although only a small one, was heard on May 5th at Wrexham, in which Mr. Henry Joyce, watchmaker, Denbigh, sued a Miss Roberts, daughter of a sheriff's officer, for 12s., the value of a brooch claimed to have been sold. The plaintiff said the defendant came to his shop on the 28th March and selected two brooches on approbation, returning one and keeping the other subject to a reduction of sixpence, which he agreed to grant. On the following Tuesday morning, however, she returned the brooch in a very soiled and dirty condition, stating that her sister, to whom it was to have been presented, had gone away. Pushing the brooch towards him, she left the shop. He then wrote her respecting it, and the letter was answered by a personal upbraiding from Mrs. Roberts. For the defence it was argued that the bargain was not made, as the sixpence deduction was not considered by the defendant's father sufficient, that Bank Holiday having intervened they could not return it till the Tuesday. In deciding the case, his Honour said there were certain principles involved in the question which must be kept in view. There must be evidence to show there had been a complete bargain made. In this case, the brooch being for the younger daughter, did away with the idea that Miss Roberts would make herself liable for it. It was a great pity that the latter did not answer the letter. He said he could quite sympathise with Mr. Joyce, as he had had a similar case before him where a young fellow had secured some studs on approbation and returned them, and it turned out afterwards that he had worn them at a ball. As it was, he was obliged to give judgment for the defendant, with costs.

Messrs Hancocks and Co., 152, New Bond-street and Bruton-street, jewellers and silversmiths to the Queen and the Prince and Princess of Wales, have received through the Italian Consul-General letters patent from the Minister of the Household of the King of Italy appointing them purveyors to His Majesty.

A Valuable Lens Measurer.

Our illustration shows an instrument, the invention of the Geneva Optical Company, of Chicago, U.S.A., for measuring the focuses of all kinds of spectacle glasses. Messrs. Botwright and Grey, opticians, of Clerkenwell, are the agents for the sale in this country. The important feature of the instrument is that upon pressing the face of a lens, as shown by illustration, squarely and firmly upon the three points, the central point is depressed until all three touch the face of the lens, and the curvature of the lens determines the amount the central rod is depressed, the focus of each surface of the lens being indicated upon the dial. Opticians are thus enabled to measure quickly and accurately the power of any form of lenses used in spectacles, and to ascertain the axis of cylinders. It has received the commendation of some of the leading ophthalmic surgeons, including Dr. Landolt, of Paris, and is sure to become popular among oculists and opticians here and abroad, for no one who has seen it will be slow in adding it as an almost indispensable supplement to his trial case of lenses. We can congratulate the above firm in securing the agency for this ingenious instrument, and only wonder no one has taken it up before. In its action and mechanism it is somewhat akin to an aneroid barometer, where the varying curvature of the lens represents the sensitive metal whose motion is conducted to the index hand. Providing the lenses used have the same refractive indices, it is scientifically accurate.



LIBRARY
JUN 9 1891
U.S. PATENT OFFICE.

Plans have been prepared for a new tool shop at the Prescot Watch Factory. The present tool shop is part of the main building; but this branch of the business is so extensive that the new establishment, which it is proposed to erect at the side of the present building, is to be half as large as the entire premises of the present factory.

As Robert Young, watchmaker, Coburg-lane, Leith, was about to enter a train at the Waverley Station, Edinburgh, recently, he slipped and fell between the train and the platform. He was extricated with some difficulty and conveyed to the Royal Infirmary, where it was found that his left arm had been broken.

Postal Order Swindles.

IT has become necessary to be as careful over postal orders as over cheques. A case was brought up at Bow-street the other day by Mr. Breton Osborn, a solicitor of the General Post Office, in which a youth named Samuel Borrett, 19, described as a confectioner, was charged with obtaining a diamond ring, value £15, by means of fictitious money orders, and with attempting to obtain a pair of diamond earrings, value £15 15s., by the same means.—Mr. Osborn said the arrest of the accused was regarded as a very important capture by the Post Office authorities. For some time tradespeople and others had been defrauded to a considerable extent, goods being obtained by means of forged cheques and forged postal and money orders. The prisoner was alleged to be associated with the gang. The frauds had not been confined to the metropolis, but for months past had been perpetrated on tradesmen in Manchester, Liverpool, Brighton, and other provincial towns. Operations appear to have been transferred to London quite recently. On Saturday, Messrs. Wales and McCulloch, jewellers, of Ludgate-hill, received a letter from Dunchurch, near Warwick, dated 2nd May, and being worded as follows:—

"Dear Sir,—When passing your shop on Friday, my daughter saw a pair of diamond earrings (single stones) which she is anxious to have. She says they were in the left-hand top-corner of your window and the price is 15 guineas, and were the only pair at the price. To satisfy her I have sent you P.O.'s for £15 15s., and as the postal arrangements to Dunchurch are very bad I am writing to a young friend in London, who is coming here, to call at your place on Monday before going to Euston.—Yours truly, F. J. Hilliard."

The same morning a similar letter was received by Mr. John Aitcheson, a jeweller of Ludgate-hill. Postal orders covering the amount mentioned were forwarded in each case. They were filled up in a good handwriting, and the printed matter was a facsimile of a genuine money order, but the whole form proved to be counterfeit. On Monday morning the prisoner called at Messrs. Aitcheson Bros., Ludgate-hill, and presented a letter signed "F. J. Hilliard," asking that the bearer might receive the diamond ring, as per letter sent enclosing P.O.'s for £15. The ring was handed to him. The prisoner then proceeded to the shop of Messrs. Wales and McCulloch, and presented a similar letter. The firm had, however, made enquiries at the General Post Office, and at once ascertained that the orders were forgeries. The orders had been crossed, necessitating their payment through a bank.

Constable Schaler said that he saw the prisoner at the shop of Messrs. Wales and McCulloch, and he asked him where he was going to take the earrings. He replied, "To a man who is waiting in the City News Rooms." There, however, he failed to identify anyone.

The prisoner was remanded for further enquiries.

Improved Watch Dials.

IN noticing the numerous processes of engraving and transferring that have been invented in the development of the printers' art, we have often been surprised that nothing has been done to supplant the old system of hand-painting and ruling of watch dials. We have several times had discussions upon the subject with the prominent men of that craft, and they have always maintained that a system similar to that which is now employed at Elgin was practicable. The method of procedure is as follows: The pattern of the dial wished to be produced is engraved upon a steel plate, from which is made a matrix of brass; from these are taken electrotypes; they are then covered with the pigment to be employed, which, after careful wiping off from the surface, remains in the engraved lines; they are afterwards placed on a flat revolving table, and collodion poured upon them. The circular action in a few moments disposes of the collodion in a thin and even film over the electro. The collodion film then receives the impression of the ink. It is then backed by paper to facilitate the handling, and taken off and laid carefully on the dial; and after the removal of the paper backing the dial is heated, in which process the collodion is evaporated, and the pigment firmly fixed on the enamel. It is needless to observe that dials can be produced by this system at a very small cost, and must of necessity be far more accurate than those executed by the old process; the steel pattern when once made practically lasting for ever. The electros, of course, lose their sharpness after a while, but their cost is comparatively nothing. As many colours as wished can be introduced as easily as one colour.

Oriental Treasures in the Isle of Skye.

ARCHÆOLOGISTS are at the present time a little bit puzzled to account for the existence of the hoard of Oriental treasures recently discovered in the Isle of Skye. Frequent discoveries of Oriental and Phœnician ware are made in Cornwall and Wales; but their presence there is easily accounted for. The well-known example of Phœnician work in the gold vase found some years ago is an illustration of a case in point, it being tolerably certain that the old seafarers visited the shores of Britain long enough before it was known to the Romans, and by this means their wares became exchanged with the Ancient Britons. But with the Skye discovery the case is very different. Here, in a cave in a small island on the north-west coast of Scotland, apparently directly out of all communication with the East, have been found various articles of jewellery and silver coinage. The latter may possibly furnish some direct evidence of their origin. There are seventeen silver "Cufic" coins about the size of a florin, around the edge of which are two lines of inscription in old Arabic characters, and although very difficult to decipher, it is easy to make out the formula of the Mahommedan faith, but their date and mintage are not so certain. It is, however, probable that they belong to the early portion of the tenth century, and also that they may have originated at the mints of the Abbasside and Samasside caliphs at Bagdad and Samarcand. There are also fifteen ingots of silver chopped into lengths of about half-an-inch. Amongst the jewellery and articles of personal adornment discovered are portions of thin bracelets showing marks of rude chasing; also a large solid silver bar brooch, about a quarter of an inch thick, with punched ornamentation on both sides. The largest article, however, is a silver torc or neck ring, about twelve inches in length, of circular shape, and at each of its tapering ends is a hook. The most probable explanation of their present position is that they were concealed there by the Vikings, who about this time were sweeping round the west coast of England, Scotland, and Ireland, and occasionally penetrating as far as the Baltic, the latter place at this period being in commercial communication with the East. The Oriental origin of the treasures is thus accounted for, and silver being in those days the medium of exchange, it was stored up for future use, the Island of Skye being selected as a place of concealment.

*

Retail jobbings include the facts that Messrs. Harris and Sheldon have just completed a handsome new shop-window for Messrs. Wray and Sons, of New-street, Birmingham; and Messrs. Wood and Co., of the same street, have placed their shop-front in the hands of this firm, who have succeeded in rejuvenating it most effectively.

The German Exhibition.

THE thing which has struck us most about the exhibition at Earl's Court is the total want of arrangement in the exhibits. There is absolutely no guide to the locality of any particular exhibitor, except that it is just possible to get a vague idea of the situation of the section in which his wares are classed. The stalls are unnumbered; the catalogue is not even in alphabetical order, and is about as worthless as such a publication can be. To add to the difficulty of describing the exhibits that interest our readers, they are included in a most miscellaneous section which ranges from table covers and stoves to leather driving belts and petroleum motors.

As a matter of fact, the show is not of great interest to a business man in our trade. There are one or two good collections of Black Forest carved work, a few stalls of so-called novelties of Pforzheim manufacture, and some filigree work, all worth seeing, but there is nothing new about any of them. With one or two exceptions the large manufacturers are not showing, and we should say that a great proportion of the stalls are held by small London dealers, who are doing a peddling trade in knick-knacks under the cover of the name of a German firm. A noteable exception to this is the exhibit of the Fürstlich Stollbergisches Hüttenamt, of Ilsenburg, who have a superb stand of trophies in artistically wrought iron. Still, the produce of their forges and workshops is perhaps a little outside our line. We mention this stand of antique arms and a museum of amber, in every variety and colour, shewn by Stantien and Becker, because they alone rescue the section from the charge of utter want of novelty. Still, there are a few exhibits that stand out from the rest in interest, and we will particularise them. The Hamburg Optical Company are well known as dealers in cheap opera-glasses and spectacles, and they are here represented by the same London agent as Georg Schmidt, of Schmiedefeld, manufacturer of cheap thermometers. Martin Lange, of Berlin, shows an excellent collection of imitation stones, of which we picked out the turquoise, emerald, and diamond as being something out of the ordinary run of counterfeits. Next to this stall, J. T. Schmida, of Schlegel, is showing cups and vases cut out of jaspar and chalcedony from Southern Siberia. These are well worth looking at. He also has some very good and tasteful work in oxydised silver on his stall. Mr. James Koral, of Houndsditch, representing four good German houses, has an excellent exhibit. Very noticeable are the Bohemian glass ornamented with silver works, and the tea-trays in Majolica ware and Dresden china. Perhaps the most novel things at this stand are the hand-painted shells containing metal figures meant for the decoration of the mantlepiece, and the silver-gilt flower vases set with imitation stones. Speaking generally, we cannot compliment Germany upon this exhibition. It is by no means a representative gathering together of her industries.

The Consular Reports on Trade.

THERE is little of interest to our trade in the lubrications of English Consuls abroad, so far as their reports have come to hand. The officials in Switzerland are still to be heard from, and the rest seem to trouble their heads little with watchmaking and watchmakers. The only item of direct interest we find is in the report of the Consul at Suakin (Egypt). Special attention was drawn in his reports of the previous year to an export trade in silver ornaments from this port. He now states that this has greatly increased, and that the trade in gold and ivory is also of importance. The Consul at Tainan (Formosa) reports an interesting discovery of gold near Liangchiao. A landslip, occasioned by heavy rains, carried away the entire side of a hill in the lower range, leaving a considerable amount of the metal exposed. For a short time the neighbouring Chinese gave a basketful of rice in exchange for the same measure of earth from the hill side. This traffic was stayed by the return of the aborigines, who had previously deserted the place, and the Chinese are unable to get more of the precious metal. Gold is also becoming a considerable export from the third largest island in the world, Madagascar. During the past year 18,200 ounces, or thereabouts, have passed through Antananarivo to the coast for shipment, and the Consul estimates that 10,000 ounces more have enriched the city. This is hoarded secretly by reason of a law passed in 1881 prohibiting mining under a penalty of 20 years in chains, and assigning half the time of torture as the penalty for a person found in the possession of gold-dust. Thus treasure seeking operations have been confined to "scratching at the surface of the country," as the Consul puts it. And under these circumstances an output of over £110,000 worth of gold in twelve months is surprising evidence of the wealth of the country. "In spite of the severity of the laws," writes the Consul, "gold began to be offered for sale to foreigners, who hesitated to buy only long enough to convince themselves that laws which were not respected by their makers could hardly be binding upon other people. As usual, British subjects were expected by the Malagasy authorities to be a moral example to every one. But it was not found possible in this instance to get them to sit down and meditate on the virtues of obedience, while less easily entreated foreigners and scores of natives of the ruling classes were doing profitable business. It is no exaggeration to state that the illicit purchases have exceeded three-fourths of the total above estimated. The price has ranged from £2 10s. to £3 7s. 6d. for the weight of an old Mexican dollar, equivalent to $1\frac{1}{25}$ ounces. On one occasion so much was offered for secret sale in a town which shall be nameless, that the traders could not muster enough dollars to buy it. The last lots were bartered for cotton goods." In Russia, also, the law of the country prohibits dealings in gold, and our Consul, in drawing attention to this, recounts the operations of a gang of swindlers at Riga:—"In the most impudent and bare-faced manner they defrauded persons, some of them Englishmen, out of large sums of money by inducing them to purchase 'gold-sand,' alleged to have been brought from Siberia, but which proved to be simply brass filings without a particle of gold amongst it." There is nothing in the remainder of the reports printed up to the present that calls for attention, but we shall probably be able to add to these extracts in our next number.

THE Austrian patented process for silvering articles of iron is a very interesting one. The article is first plunged into a pickle of hot dilute hydrochloric acid, whence it is removed to a solution of mercury nitrate, and connected with the zinc pole of a Bunsen element, gas, carbon or platinum serving as the other pole. It is rapidly covered with a layer of mercury, when it is removed, washed and transferred to a silver bath and silvered. By heating to 300° C. (572° Fahr.) the mercury is driven off, and the silver firmly fixed on the iron. To save silver the wire can be first covered with a layer of tin; one part of cream of tartar is dissolved in eight parts of boiling water, and one or more tin, or anodes are joined with the carbon pole of a Bunsen element. The zinc pole communicates with a well-cleaned piece of copper, and the battery is made to act till enough tin has deposited on the copper, when this is taken out and the ironware put in its place. The wire thus covered with tin chemically pure and silvered, is much cheaper than any other silvered metals.

ANSWERS TO CORRESPONDENTS.

Aurum.—Nuremberg gold is a German alloy; we think it was made first in the town from which it derives its name. We were shown it some time ago, and informed that a great deal of it had been pawned as "fine" gold, and also that a large quantity was being sent to Birmingham made up into jewellery. It certainly has a remarkably good appearance, and breaks with a fracture somewhat difficult to tell from coloured gold; it is thus all through alike. We believe its composition is, gold 3 parts, aluminum 7, copper 18.

Mr. R. L. Rennison would be glad if any of our readers could inform him from whom he could get Foxe's patent eye-glasses; they are American manufacture.

H. Brook.—The stone sent is usually called a cat's-eye, although it ought not to be so styled. The name in reality should be reserved—and, indeed, is by all authorities—for that variety of chrysoberyl which exhibits the same phenomenon as the stone sent. But although this is a very nice colour, and the ray very sharp, bright and well-defined, it has nevertheless no claim to be called a Ceylon cat's-eye, despite its having come from that place, which is recognised as the home of the true chrysoberyl cat's-eye. The one you send us is only a fibrous variety of quartz, and although the fibrous structure is so fine as to be practically invisible to the naked eye, and its general appearance such that "every jeweller who has seen it affirms it to be a true cat's-eye," we can assure you it is not. The simplest method of distinguishing between a fine quartz cat's-eye and a true one of inferior appearance is its hardness. A piece of topaz or any other stone harder than quartz, and not so hard as chrysoberyl, would naturally cut the former but not the latter.

Scottie.—Despite what has recently been said regarding the introduction of watch and clockmaking into Scotland, we have before us accounts of some very much earlier examples. We cannot guarantee the truth of it, of course, but it is said Robert, king of Scotland, had a watch in 1310. Nuremberg is usually credited with having produced the first watch in 1477. Certainly, about 20 years after that, they were used in observatories. We have recently heard of some old Scotch timepieces which we hope to describe.

John Hobson, Stockton-on-Tees.—You are somewhat mistaken in your supposition regarding the firm whom you entrusted with repairs, and by this time you will probably agree with us. We caused inquiries to be made, and find there is a perfectly valid reason for everything which to you may appear rather mysterious. Of course you will still continue to exercise your own discretion in further business transactions with them; but you may rely upon it that this Journal shall *never*, if we can prevent it, become the vehicle for dishonest practices.

* * *

We are sorry to inform our readers that we are obliged to hold over numerous interesting and important contributions till next month, owing to want of space; amongst which are a full description of Mr. Story's new patent regulator, an interesting article upon the present system of bankruptcy laws, new patents, etc.

Mr. Albert Swingewood, of 81, Caroline-street, Birmingham, manufactures all kinds of jewellery cases from small ring cases up to elaborate ones, to contain whole suites of jewels. He is also engaged in making glass show-cases for the display of jewellery in windows, etc.

John Harrison.

By James U. Poole.

(Continued from page 239.)

The Astronomer Royal finally reported on the instrument as follows:—"That Mr. Harrison's watch cannot be depended upon to keep the longitude within a degree in a West India voyage of six weeks, nor to keep the longitude within half a degree for more than a fortnight, and then it must be kept in a place where the thermometer is always some degrees above freezing; that in case the cold amounts to freezing, the watch cannot be depended upon to keep the longitude within half a degree for more than a few days, and perhaps not so long, if the cold be very intense; nevertheless, that it is a useful invention, and, in conjunction with the observations of the distance of the moon from the sun and the fixed stars, may be of considerable advantage to navigation." The Astronomer Royal also took exception to the great increase of rate since the voyage; in the interval the instrument had been cleaned, and he considered that the former rate should have been maintained. Harrison was requested by the Board of Longitude to make two similar instruments for testing at the Royal Observatory, but it does not appear that this condition was complied with. He made one for the King, which, after ten weeks' trial at his private observatory at Richmond, is said to have varied only 4½ seconds. It is currently believed that His Majesty personally interested himself on Harrison's behalf, and that the remainder of the reward was paid over in consequence of his intervention. As a matter of fact, the instruments had become obsolete before they were paid for. Mudge, Arnold, and Earnshaw were all in the field, appropriating Harrison's and each other's improvements indiscriminately.

When Captain Cook sailed on his second expedition in 1772, he had three of Arnold's with him, in addition to the historic one of Kendall's already mentioned. Two of these are in the possession of the Royal Society, and I cleaned and restored them early last year. They have a rude form of the present chronometer escapement, and beat half-seconds. Although roughly constructed, they prove Arnold's inventive genius to have been quite on a par with Harrison's, and there is no doubt but that the Astronomer Royal and the scientific men whom he consulted considered that Arnold's instruments were likely in the long run to give better general results than those of Harrison and Mudge—the latter having adopted a form of the verge escapement which was quite as complicated as that of Harrison's remontoire. John Harrison, however, was the pioneer of the improvements which have gradually led up to the perfection which is expected at the present time. Five miles is now the maximum limit of error which is allowed in a first-class Government chronometer, and the longitude is frequently determined within one. At the same time, the science of navigation has made such progress that the manufacture of chronometers is yearly becoming less advantageous to those engaged in it; and it is only when a vessel, like the *Calliope*, is suddenly driven out of her course, that those in charge of her feel really dependent on the excellence of their chronometers; but it is a sound principle to be always ready for the unexpected, therefore their use, in a limited degree, will always remain as a necessity.—*Observatory*.

* * *

Notice to our Readers.—In consequence of the pressure on our space, several matters of importance, in addition to those noted in another column, are unavoidably held over for our next issue,

New Books.

The Metalworkers' Handy Book of Receipts and Processes. By W. T. Brannt.

We can heartily congratulate Messrs. Sampson, Low and Co., upon the publication of an English edition of the above useful book. In addition to its usefulness, it has this peculiar charm: it does not commence with a lot of "dry" detail of chemical notation and formula, and enumeration of laboratory experiments to enable the worker to understand the reactions that take place in the ordinary operations by which he is daily surrounded; but, on the contrary, it teaches him chemistry from the simplest operations he performs in the course of his business, thus, while making him thoroughly practical, it at the same time enables him to understand the scientific laws that underlie each of the operations in which he is engaged. In the chapter on alloys there is a useful enumeration of the physical properties of alloys, and the difference they bear to the exhibition or absence of the same properties in their constituent metals, such as their tenacity and fusing points, and in connection with the latter a test of the composition and the melting points of many alloys are given from 150deg. F. to 341deg. F. This is followed by about forty pages of descriptions of nearly all the principal alloys employed in the arts. The most interesting to our readers will probably be those connected with the alloying of gold, so as to produce various colours, although they are of course not to be compared with the researches of our Mint master in that direction. The chapter on annealing, hardening, and tempering metals also contains much useful matter, as does also the bronzing and colouring. The remarks on casting and founding, although only useful to a limited number connected with our trades, ought not to be passed by. A table of the specific gravities of the various woods employed for patterns will also be valuable in getting out estimates. Cements, etc., many of which are very good, receive attention in the next chapter. Cleansing, grinding, nickeling, polishing, decorating, enamelling, engraving, and etching, are then dealt with, after which a larger portion is devoted to electro-plating with various metals: to fluxes, lacquers, solders, and welding compounds, supplemented with a collection of useful miscellaneous receipts. We recommend this book to all who are in anyway engaged in the metal trades, the information being thoroughly reliable as far as we have been able to estimate; and, being derived from sources from which books published in this country are not, it is bound to bring forward some new methods, many of which are doubtless better than those now in common use.

Flowers of the Mineral World, or Something about the Gems we Wear. By J. E. Brownbill, M.A. (of the firm of Brownbill and Iliffe), jewellers, etc., Leeds.

This is a well-printed, well-bound, and well got-up little brochure, and no doubt will serve as a good advertisement for the firm whose member wrote it. There are ten gems selected as the flowers of the mineral world, viz., diamond, ruby, sapphire, emerald, topaz, garnet, opal, turquoise, pearl, and amethyst. A few lines of description of the more obvious and general characteristics and lore of each are given in a very interesting and readable manner, as indeed we should expect from a gentleman of Mr. Brownbill's attainments. The Queen and the Princess of Wales have accepted copies. H.R.H. wrote: "I am to express to you the thanks of Her Royal Highness for giving her the opportunity of perusing this interesting little pamphlet." It is thus evident it is eminently suitable for the purpose for which we presume it was written. Such being the case, we dare not be critical; if we are, we hope the author will take our remarks in the spirit in which they are given. Firstly, we are totally at a loss to understand why he should have fixed his choice upon this ten. Certainly not because they are the most beautiful, popular, or valuable. We should have also expected him to know that the "Mattam" has long been known to be a piece of quartz, and that Captain (afterwards Colonel) Fitzgerald repudiated his first account and model of the "Nizam," which, as he said, was upon "hearsay," and gave another model and weight after carefully weighing and copying it. As he was attached to the Nizam's service, and had every opportunity of studying it, we think the latter description is more likely to be the correct one, although various weights have been given for it, ranging up to 440 carats. The remark upon green garnets, too, is very misleading. Uncut green garnets are now before me certainly three-quarters of an inch long, some of them being charming fiery specimens (which, for dispersion, are only excelled by the sphene) of two carats each. The remarks that the garnet is the only transparent stone cut Cabochon, and that a rough diamond must first be cut into an octohedron, are surely slips of the pen which, together with those previously pointed out, might be altered in the next edition.

Screws and Screw Making, by the Britannia Company, Colchester, is one of the bulkiest and most comprehensive volumes on the subject of screwmaking we have yet seen. Much of the matter contained in the book has hitherto been inaccessible to the ordinary worker, owing to its being scattered through the costly and little read "transactions" of several learned societies. The whole system of screws, their thread-forms, pitches, and diameters are dealt with in the work under notice, and for that reason it should be invaluable to those interested in horological mechanism, and anxious to obtain full information anent Professor Ghury's tabulated system of watch screws.

APPLICATIONS FOR PATENTS.

(*Expressly compiled and contributed for this Journal by* Messrs. W. P. Thompson and Co., F.C.S., M's.I M.E., Patent Agents, 6, Bank Street, Manchester; 6, Lord Street, Liverpool; and 323, High Street, London, W.C.)

6,344.—C. Jennens and W. F. Jennens, Birmingham, "Sleeve links." Dated 13th April, 1891.

6,617.—C. H. Errington, Coventry, "Letting down the mainspring in a keyless watch without removing the watch from the case." Dated 17th April, 1891.

6,828.—F. A. Walton, Birmingham, "Sleeve-links." Dated 21st April, 1891.

7,025.—G. G. Birrell, Glasgow, "Sleeve-links." Dated 23rd April, 1891.

7,112.—C. C. Burgis and R. T. Garrett, Birmingham, "Finger-nail cleaner." Dated 26th April, 1891.

7,143.—Elkington and Co., Limited, and S. F. Rollason, London, "Stands for supporting articles in show cases, shop windows." Dated 25th April, 1891.

7,291.—T. Perks and Sons, Limited, and B. J. Perryman, London, "Scarf pins and brooch pins." Dated 28th April, 1891.

7,421.—P. Maycock, London, "Sleeve couplets or links." Dated 29th April, 1891.

7,629.—J. X. Ganz, Bristol, "Closing boxes for transmission by post or otherwise of jewellery, etc." Dated 2nd May, 1891.

7,677.—E. E. Thompson, Aston, "Adjusting brooches to the dress." Dated 4th May, 1891.

7,691.—K. H. Cornish, London, "Chromotropes applicable for theatrical scenery." Dated 4th May, 1891.

7,741.—J. Isherwood, Manchester, "Spoon cleaning." Dated 5th May, 1891.

7,814.—J. Carter, Halifax, "Sleeve links." Dated 6th May, 1891.

7,838.—A. B. Cunningham, London, "Salt and pepper casters." Dated 6th May, 1891.

7,956.—J. Gunther, London, "Watch and clock movements." Dated 8th May, 1891.

7,966.—F. Harris, London, "Brooches." Dated 8th May, 1891.

7,984.—W. J. Ward, Jr., Newcastle, "Cuff links." Dated 9th May, 1891.

Police News.

The Proceeds of the Johannesburg Robbery.—The Chief Commissioner of Police has been summoned under the Summary Jurisdiction Act for detaining a large quantity of jewellery, the proceeds of the burglary at Johannesburg.—Mr. St. John Wontner, who appeared in support of the summons, said a short time since three men were charged with being in the possession of a large quantity of property, which was proved to have been the proceeds of a burglary at Johannesburg. Inasmuch as that Court had no jurisdiction in the matter, his worship had to discharge the men, and the property remained in the hands of the Commissioner of Police.—Mrs. Sarah Simpson, of St. Andrew's-road, Southsea, the wife of the owner of the jewellery, said she acted for her husband under a power of attorney.—Mr. Dickinson said that was sufficient, and he made an order for the delivering up of the property to Mrs. Simpson. We cannot help feeling that there is something radically wrong in the law, or the way it is administered, when a magistrate is able to dispose of goods found in possession of a defendant and yet have no jurisdiction over him. It was said at the former hearing of the case that he ought to have been arrested in the street. Could he not have been re-arrested in the street and charged with unlawful possession?

Railway Companies and Commercial Travellers.—His Honour Judge Jones, sitting at the Oldham County Court, recently heard an action in which Samuel Hurst, wholesale watchmaker, Union-street, Oldham, sued the Lancashire and Yorkshire Railway Company for £10 damages for the detention of a case of samples. It appeared that on the 19th January the plaintiff started on a journey from the Central Station, Oldham, to Horwich. He had three sample cases, which were labelled and placed in the van of the train. At Manchester there was a change of trains, and the plaintiff saw his luggage put in the train, but when he arrived at Horwich there was one sample missing. It was not brought to the plaintiff for eight days, and it transpired that it was taken out of the train at Bolton, and had been at one of the theatres for a week. The damages claimed were the loss of profits on orders that were missed through the absence of the samples. The Judge said the evidence as to damages was weak, and gave a verdict for the plaintiff for £6 10s. with costs.

An Old Trick.—At North London Police-court, William Lyons, 19, a watchmaker and jeweller, with no address, was charged on remand before Mr. Marsham with stealing a variety of articles—watches, clocks, a musical box, etc.—intrusted to him to repair. The police said they had 12 different cases against the prisoner. Prisoner committed for trial.

An Unlucky Find.—On March 18th, Mrs. Alexander, a lady living in Upper George-street, Bryanston-square, attended a fancy dress ball at Covent-garden theatre, wearing a diamond and ruby brooch made in the form of a swallow. About a week later, when she wished to wear the brooch again, her maid informed her that she could not find it. Having no idea where or when it had been lost, and thinking that too long a time had elapsed for it to be traced, Mrs. Alexander did not trouble to report the matter to the police. On April 26th, Anton Pollock, a French waiter, showed Mr. Robinson, a pawnbroker of Mortimer-street, Regent-street, a diamond swallow brooch, and asked him how much he considered it to be worth. Seeing that the article was at least of the value of £100, Mr. Robinson saw the police about the matter, and Detective-serjeant Weatherhead in the evening arrested Pollock for unlawful possession. Pollock, who then said that he picked the brooch up in March outside the Covent-garden theatre, was remanded for a week, and, a report of the case having been published, Mrs. Alexander laid claim to the brooch. Pollock was sentenced by Mr. Hannay at Marlborough-street to two months' imprisonment.

Gazette.

Deeds of Arrangement.

Clarke, Arthur, 88, Shudehill, Manchester, and 39, Northern-grove, Didsbury, near Manchester, wholesale jeweller. Trustee: George G. Poppleton, 26, Corporation-street, Birmingham, accountant. Filed May 12; liabilities £299 15s. 8d.; assets £72 10s. 11d.—*Creditors:*—

		£	s.	d.
Cox, W. F.	Birmingham	19	18	0
Griffiths, A. G.	,,	28	8	0
Hollis and Newman	,,	12	18	6
Male and Jones	,,	11	9	0
Perks, Mark	,,	15	0	0
Saunders Bros. and Greaves	,,	10	10	6
Clarke, Stephen	Manchester	150	0	0

Honley, George and Co. (George Honley, trading as), 97, Market-street, Bacup, jeweller, musical instrument dealer, and publisher. Trustee: George G. Poppleton, C.A. (Poppleton and Appleby), Birmingham. Composition of 10s. in £, payable to trustees by monthly payments of £12, commencing June 25, 1891; trustee to divide rateably, secured by assignment to him, debtor to carry on the business under his control. Secured creditors, £9 13s. 9d. Filed May 14; liabilities £605 13s 10½d.; assets, £338 13s.—*Creditors:*—

		£	s.	d.
Beare and Sons	London	24	2	7
Lawrence, Henry	,,	29	11	4
Murdock, J. G. and Co., Limited	,,	324	3	2
Cooke, William	Birmingham	31	19	9
Harris, Henry and Co.	,,	50	4	4
Rothwell, E. D.	Blackburn	16	0	0
Brown, James	Bradford	13	13	2
Tillotson, J. and Sons	Clitheroe	13	19	6
Smalley and Briggs	Wigan	55	18	2

Robertson, John, jeweller, 99, Oldham-street, Manchester.—Amongst the creditors are:—

	£	s.	d.
Fitten, E. W.	88	1	4
Amos, D. Fier	36	19	9
Ginder, W. J.	157	9	8
Hill, T., and Co.	170	0	0
Attersley and Co.	29	2	0
Lee and Wigfull	67	10	7
Laurenberg, D.	186	0	0
Lingard and Hogan	37	3	0
Liverpool Loan Co.	174	0	0
Michael Bros.	48	17	0
McKenzie and Good	21	9	6
Marston, H.	22	10	11
Morrison, W.	308	4	0
Neale, L. E.	13	0	1
Allday, J., and Son	36	0	0
Allday, H., and Son	78	14	2
Brook and Co.	123	8	8
Bendon, G., and Co.	84	3	5
Batt and Sons	23	9	0
Blankensee, Meyer	700	0	0
Blankensee, J.	307	9	6
Blankensee, S., Ltd.	400	5	0
Blankensee, L.	33	19	3
Brittain and Sons	54	2	2
Carlisle and Bometz	61	16	6
Constantine and Floyd	33	13	9
Daniel and Arter	48	5	2
Deakin and Sons	91	6	1
Evans and Brown	81	3	5
Newsome and Co.	41	0	0
Rounds, S.	81	8	1
Robertson, D.	61	0	0
Southam and Richardson	19	18	0
Sylvester, J.	38	19	2
Weale and Co.	91	0	0
Wing, G.	13	7	6
Willis, T.	69	14	2
Perferential Creditors	73	2	0

Creditors resolved to accept 12s. 6d. in the £, at 3, 6, 9, 12, 15, 18, 21, and 24 months, the last 5s. secured.

INDEX TO VOLUME XVI.

A

PAGE
Advertise? How do you 94
Agate, A Bridge of. By George F. Kunz 91
Answers to Correspondents, and Original Correspondence, 140, 158, 184, 206, 227, 249, 267
Art in Birmingham 126
Art, Opening of the Birmingham Technical School of (for Jewelry) 71

B

Bankruptcy, etc. 23, 47, 69, 95, 116, 138, 161, 182, 204, 225, 247, 269
Baxter, Presentation to Mr. Thomas 263
Bennett, Sir John, Limited.. 243
Beryl, Natural forms of 155
Birmingham Jewelers' and Silversmiths' Association .. 78, 201
Birmingham Jewelers' and Silversmiths' Association's Banquet 202
Board of Trade Returns 186
Bracelets, Poetry in 16
British Association, Utility of 35

C

Ceylon's Treasures: How found 60
Chronometers at Royal Observatory 33
Cleverly duped by swindlers 147
Clockmaking Industry in Dieppe 14
Clockmaking, The history of American 58
Coventry Watch Trade Association 108, 212
Creditors, Meetings of 41
Crocus, How to prepare 68
Crystallography of Gems. By W. J. Lewis-Abbott, F.G.S., 88, 104, 133, 155, 176, 199, 218, 240, 261.
Custom House: American statistics 59

D

Darwin medal, The 143
Design for Jewelers and Silversmiths, The Art of Practical 55
Diamonds 62
Diamond Fields, Letter from (by Vaalite) .. 151, 171, 197
Diamond, Gordon-Orr 44
Diamonds in Amsterdam 11
Diamond Market, 3, 28, 51, 104, 135, 157, 174, 186, 208, 230, 264
Diamond Mines, I.D.B.'s at the 63
Diamond Mines, Output of the 108
Diamonds, Natural forms of 89
Diamond, Origin of the 15
Diamonds, Two remarkable 152

E

PAGE
Earrings, Curiosities in 61
Edinburgh Exhibition: French Section 31
Electric Light.. 208
Emeralds, Natural forms of 155
Emeralds, Testing 115
Equation of time 178
Exhibition, The German 266
Eyes, The cure of the 93

F

False description, Cases of 134
Forgery, Worse than 251
Fraudulent Jewelry in France 108

G

Garnets, Natural forms of 105
Gems, Artificial 65
Gem Company (New Siam) 39
Gems, Discrimination of 208
Gems, Some optical properties of. By W. J. Lewis-Abbott, F.G.S. 29, 52
General Notes 2, 26, 50, 74, 103
Glasgow, Death of Mr. 260
Gold Caskets abound 262
Goldmaking swindles 253
Goldsmiths' and Jewelers' Institution 132, 212
Guns of gold and a carpet of gems 149

H

Hall-marking silver plate. By Edward J. Watherston 221, 241, 262
Harrison John. By J. U. Poole 239, 267
Horological Notes (original and clipped) 129, 146, 166, 193, 211, 233, 251

I

Idocrase, Natural forms of 240

J

Jet 17
Jet, Whitby 175
Jeweler, A Famous French 43
Jewelry Guard 13
Jewelry, Icelandic 46

PAGE
Jewelry, modern fashions .. 61
Jewelry robberies .. 112
Jewelry, The postage of .. 112
Jurgensen, Jules .. 15

K

Kew report .. 177
Kullberg, Victor Obt. .. 25

L

Lancashire Watch Company, Limited, The .. 195
Laws and Liberty .. 230
Lens Measurer, A valuable .. 264
Liverpool Watchmakers and Jewelers .. 108
Liverpool Watchmakers' and Jewelers' Association .. 162, 211
Lord Mayor Savory (with portrait) .. 126

M

Malpractices in the Jewelry Trade .. 109
Manufacturers and Shopkeepers .. 9
Mayoral Chains .. 196, 228, 241
Merchandise Marks Act .. 54, 163, 185, 229, 251
Merchandise Marks Act—Important Conference .. 219
Merchandise Marks Act, Prosecutions under .. 111
Metal, etc., Markets, 3, 28, 51, 104, 135, 157, 174, 186, 208, 230, 264
Metallurgical Arts at the Paris Exhibition .. 18, 46
Metals, Colored films on .. 66
Midland Jottings .. 76, 100, 127, 148, 169, 190, 213, 235, 254
Mirrors, Japanese .. 81

N

New and Noteworthy .. 246
New Goods .. 3, 4, 5, 6, 7
News in a Nutshell .. 137
Notes about Town .. 98, 121, 144, 164, 187, 231

O

Ocular Defects (Mechanical). By Dr. C. A. Bucklin 21, 67, 106
Oriental treasures in the Isle of Skye .. 265

P

Palladium .. 82
Paris manufactories, Round the .. 231
Patents .. 47, 69, 95, 116, 134, 159, 181, 203, 224, 247, 268
Pearl Fisheries, The Mexican .. 44
Pendulum, A monster .. 108
Phenacite, Natural forms of .. 199
Plate licence, The .. 163
Platinum, Electo deposit of .. 36
Postal Order swindles .. 265
Precious stones: Lecture by Geo. F. Kunz .. 83, 112
Precious stones, Manufactured .. 13
Profits, Cut .. 39
Protective Communication Society wanted .. 119

Q

Quartz, Natural forms of .. 200

R

PAGE
Reviews.—Bibliotheca Polytechnica .. 248
Reviews.—The Metalworkers' Handy Book. W. T. Brannt .. 268
Reviews.—Flowers of the Mineral World. J. E. Brownhill, M.A. .. 268
Reviews.—Screws and Screw-making. Britannia Company 268
Rings, Anecdotes of .. 66
Royal Observatory Report of, 1889-90 .. 8
Royal Observatory.—Trial of Chronometers .. 223
Ruby Mining in Burma .. 60
Ruby Mines, The Burma .. 45
Ruby, Natural forms of .. 133
Rubies and Sapphires, Siamese .. 222
Rubies, Market value of .. 80

S

Salesmen, Hints to .. 65
Sapphire, Natural forms of .. 133
Scientific and otherwise .. 123, 153, 172, 196, 215, 238, 259
Sheffield Notes 7, 28, 51, 75, 102, 130, 150, 170, 191, 214, 252
Silversmiths' and Jewelers' Cricket Club .. 137
Silver Bill, New American .. 82
Silver, Hall-marking, in India .. 54
Silver Plate industry .. 109
Silver Trade Pension Society .. 241
Silver Trade, The .. 125, 145, 166
Silver, The value of .. 92
Spinel, Natural forms of .. 104
Spoons for collections .. 91
South Africa, Mineral wealth of .. 44

T

Tariff, New French Customs .. 155
Technical Schools, Grant to the Birmingham Jewelers' .. 3
Topaz, Natural forms of .. 261
Tourmaline, Natural forms of .. 176
Trade, Consular reports on .. 266
Trade marks law, New, in Switzerland .. 151
Trade of the Country, The .. 188, 216, 243
Transatlantic Jottings .. 136, 154, 173, 198, 210, 237, 257
Turquoise .. 143

W

Watch and Clock Makers' Asylum .. 242
Watch and Clock Making: Answers and notes to questions set at the City and Guilds of London Institute Exams. By I. Herrmann .. 167, 194, 209, 234, 255
Watch and Clock Makers' Pension Society .. 160
Watch Case Manufactory: The New Coventry .. 263
Watch Clubs .. 120
Watch Dials, Improved .. 265
Watch Factory, Stroll through the Elgin .. 57
Watch Glasses, Manufacture of .. 14
Watches, Pictures in .. 94
Watch Trade and the Merchandise Marks Acts .. 258
Watchmakers' Trade Association .. 96, 131
Watch Trade: Conference at the London Chamber of Commerce .. 32
Whitby Jet Syndicate .. 11

Y

Year, The past .. 142

Z

Zircon, Natural forms of .. 218

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